PULP & PAPER

What's New in Coating

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Union Bag's New No. 7

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Planning Maintenance Work

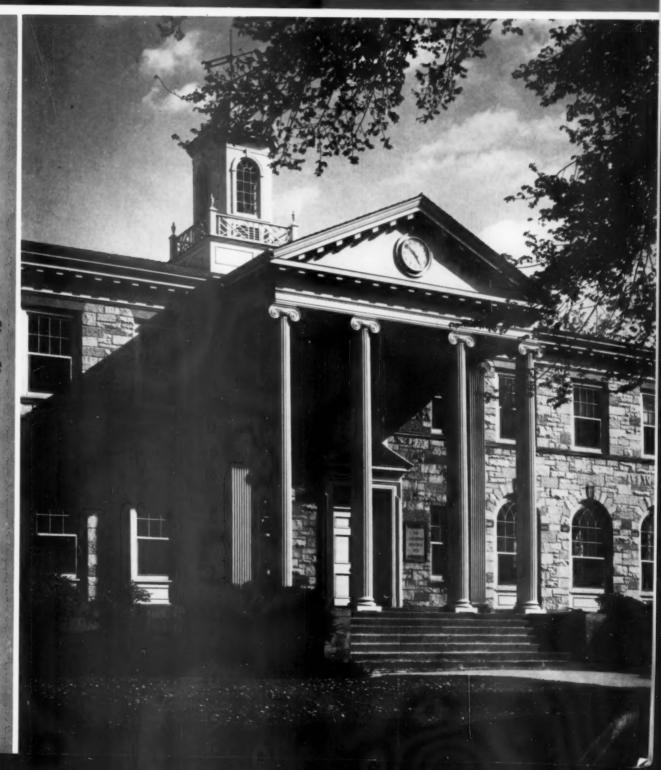
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Executives
assess
industry's
status in
research,
education
and science
at Institute
of Paper
Chemistry
annual
meeting

500

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The NEW EMERSON CLAFLIN 303

introduces the very latest advances in refiner engineering and design. For example: the first conical refiner with oil mist atmosphere lubrication system, visual oil and pressure gauges and protective warning system; high gear ratio micro-feed plug adjustment; 100 p.s.i. operating pressure; split head design; all control and inspection areas on one side; and many other features. Each contributes to even greater refining efficiency, operating ease and lower cost maintenance.

Emerson Classins serve the Papermaker for more purposes than any other refiner. This exceptional versatility is proven daily in mill after mill where Emerson Classins are demonstrating their ability to develop the following wide range of fibers with a minimum of freeness drop.

refining versatility unmatched







Fine Papers - both soft and hard wood bleached pulp

Food and Container Board — both soft and hard wood bleached pulp

Liner Board - unbleached Kraft for both base and top sheet

Bag, Wrap, Multi-Wall, Twisting and Gumming

Folding and Set-up Boxboards — both filler and liner

Corrugating Medium - semi-chemical pulp and waste Kraft

Wall Board and Roofing Paper

Hot Stock and High Yield — following blow tank

Screen Rejects - fine and coarse groundwood and chemical pulp tailings

No matter what furnish you are running, or the specifications you have established for finished paper, it will pay you to investigate the versatility and tested refining efficiency of the Emerson Classin 303 with its sectional hydrating shell and variety of other fillings. Only Emerson makes the Classin. Write The Emerson Manufacturing Co., Division of John W. Bolton & Sons Inc., Lawrence, Massachusetts.

Emerson **CLAFLIN**°

A product of BOLTON DEMERSON

Now... your tissue machine can be made to run more profitably by easy conversion to

a Rice Barton

Suction Breast Roll

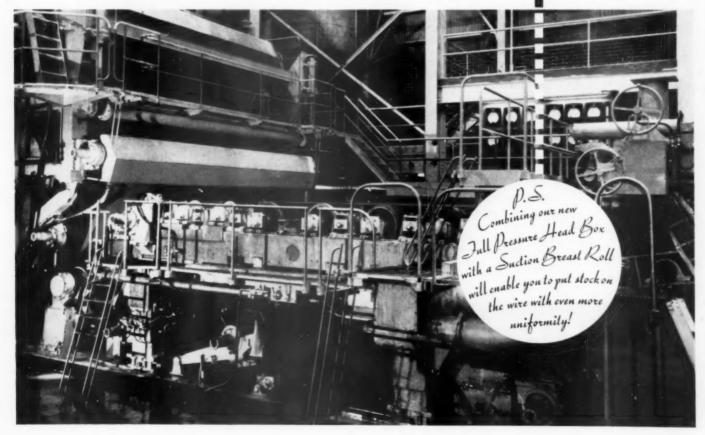
- 1. Easier, more predictable formation up to 3000 f. p. m.
- 2. Better control, more uniformity at any designed speed.
- 3. Bouncing eliminated, less fibre disturbance.
- 4. Shorter fourdrinier possible. Note short wire length below.

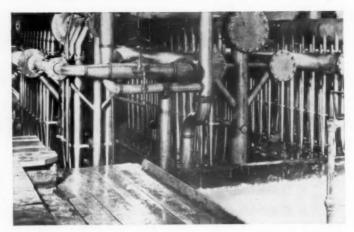
Another "first" from our drawing boards, and further proof of superior engineering that has made Rice Barton a leading paper machinery builder for 123 years. For more information on what these advantages can mean to you write



FOURDRINIERS, PRESS SECTIONS, DRYER SECTIONS, CALENDERS AND SUPERCALENDERS, REELS, WINDERS, HEAD BOXES, SIZE PRESSES, BREAKER STACKS, DIFFERENTIAL DRAW CONTROL DRIVES AND CONE PULLEY DRIVES, PULPING EQUIPMENT, HIGH VELOCITY AIR DRYERS, TRAILING BLADE COATERS, FIBRE-FLASH DRYING SYSTEMS

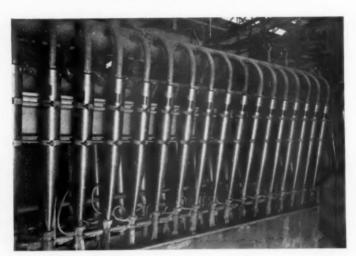






These 7-inch Cycleans are delivering 200 tons per day of clean, shivefree stock.

Is Your Paper CYCLEAN GLEAN?



These 4-inch Cycleans are safeguarding quality for a well known brand of specialty papers. They are equipped with patented, automatic purge tips that will not plug.

Bird Cyclean pressure drop cleaning units are helping their users to meet today's standards of paper quality and uniformity. They quickly pay for themselves out of the savings in rejects and breaks.

Cycleans come in three sizes: 4" dia. with inlet capacity of 36 gpm per Cyclean; 7" dia., 120 gpm; 12" dia., 500 or 850 gpm.

May we provide recommendations, layouts and estimates?



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Canadian Manufacturers of Bird Machinery
CANADIAN INGERSOLL-RAND COMPANY, Limited, Montreal

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Nearly Everyone's Coating

Not quite, but the trend is there and at TAPPI's Coating Conference P&P was on hand to report the significant trends such as the trailing blade coater, on- and off-machine coating debate, and a dry coating process.

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The Biggest Gets Bigger

P&Ps Southern Editor Bill Diehl selects the "what's different about it" features of Union Bag-Camp's No. 7 machine. Special Bonus: an exclusive report on Union's digester corrosion studies.

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Piecing together the many reports by IPC and industry officials at Appleton, Editor Al Wilson presents this thought-provoking analysis of the industry's intellectual accomplishments, with special emphasis on research.

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Planning Maintenance Work



Author Bert Carson (photo), maintenance planner at Hudson Pulp & Paper's Palatka, Fla., mill, says a tight control system is a must. He also analyzes preventive maintenance, record keeping, salvage programs, shutdown schedules.

CIRCULATION DEPT., 500 Howard St., San Francisco 5, Calif. C. C. Baake, Circ. Mgr. Send subscription orders and changes of address to PULP & PAPER, above address. Include both old and new addresses.

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Belt carries 3½ million pounds of wet pine chips a day

"Riffle Grip" belt takes chips up incline, does it fast

THAT belt carries wet pine chips from an elevator belt to storage silos in an Arkansas paper mill. But, several years ago, when the capacity of the chipper was increased by 20%, the smooth belt being used couldn't carry chips away fast enough. They'd slip back on the belt, pile up at the unloading area, tumble back down the elevator shaft.

The plant superintendent took his problem to a B.F.Goodrich distributor, who recommended the BFG "Riffle Grip" conveyor belt. The belt is made

with a series of extra-tough rubber ridges molded into the cover. The tread that these ridges form holds the chips in place on the belt, takes them up the incline, doesn't let them slip back.

The B.F.Goodrich belt completely solved the problem, permits higher belt speed, and a 20% increase in production. It's been in use over three years now, handling 3½ million pounds of chips in an average day.

B.F.Goodrich distributors have exact specifications for the B.F.Goodrich conveyor belt described here. And, as factory-trained specialists in rubber products, they can answer your questions about the many products B.F. Goodrich makes for industry. B.F. Goodrich Industrial Products Company, Dept. M-862, Akron 18, Ohio.



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The Editor Reads His Mail



Address letters to The Editor, PULP & PAPER, 1791 Howard St., Chicago 26, Ill.

Credit Where Credit is Due

-Minneapolis, Minn. Editor: As a regular reader of PULP & PAPER, I want to compliment you on the very complete list of company mergers in the pulp and paper industry for the past eight years, which appears in June on pages 75 to 78, inclusive-following the article by Mr. McSweeney of Perkins-Goodwin Co. This table will be useful and interesting to many persons in the industry and affiiliated companies. How did you get together such a complete list? NILS HAWKINSON

Editor's Note: Credit for the compiling of the mergers list in our June issue goes to C. Lester Horn, economic consultant, whose address is 120 Broadway, New York City. Both Mr. McSweeney and ourselves are very grateful to Mr. Horn, and we know that many of our readers appreciate this information.

A Correction on Noralyn **Process Report**

-Savannah Ga. Editor: PULP & PAPER has built up such a good reputation through excellent articles and complete and accurate coverage of news that I am somewhat reluctant to call your attention to a departure from your usual good style.

I refer to the article under my name on page 110, May issue.

Three of the talks, namely, Hard-

woods Can Lift World Literacy, by J. H. Ainsworth; Hardwood Use from Forester's Viewpoint, by P. R. Wheeler; and International Impact of Pulping Process, by J. R. Owens were reported well. The one on Production Steps in Hardwood Newsprint by William L. Belvin, includes remarks made through a reporter.

Actually what was reported is factual information which I am proud to have recorded under my name with one exception and I quote: ". . Savannah, 42,000 copies per hour were printed which is the top speed of the machine. Subjection to rigorous testing procedures, exceptionally long machine leads (as great as 38 ft.), and frequent right-angle turns failed to cause breaks in the Noralyn It should sheet during printing." read (as great as 68 ft.).

All of this supports the indication of the high quality of the newsprint developed

WILLIAM L. BELVIN Director Herty Foundation

Equipment for Hardboard

Editor: We notice from one of your recent issues an article about the expansion of N.Z. Forest Products Ltd. of New Zealand and their purchase of new paper machinery.

It may be of interest to your readers to know that N.Z. Forest Products are expanding the manufacture of insulating board and S-2-S hardboard (the original mill was built by the writer in 1941) and are doubling their capacity.

The equipment was purchased from The Tayler Corp. (32 W. Scott Place, Elizabeth, N.J., U.S.A.) after a study of most of the mills in the United States and very many of those in Europe. The company had their manager, chief engineer and engineer in charge of research and development visiting mills for two months.

The equipment purchased included a double-cylinder forming machine made by Ahlstrom, a press section made by Ahlstrom, a wet saw made by Ahlstrom, a tipple, dryer and un-loader made by Wallboard Dryer Corp., a transfer made by Wallboard Dryer Corp., mat handling equipment made by Wallboard Dryer Corp. and a 5 ft. x 12 ft. hydraulic press capable of 1,500 psig. pressure and a temperature of 500°F. from Siempel-

W. R. TAYLER The Tayler Corp.

Correction—Saskatoon

Editor: We read with interest the article on Prairie Fibreboard Ltd., on pages 78 and 79 of your May issue. We note, however, underneath that you have listed us as the suppliers of vacuum pumps, whereas we should be listed as the supplier of the vacuum washer.

ARNE G. HELLSTROM Vice President and General Manager Paper Machinery Limited



Pulp from Gottesman means... TECHNICAL SERVICE!

Bleached and Unbleached Sulphite • Bleached Hardwood • Groundwood Bleached, Semi-Bleached, and Unbleached Kraft

GOTTESMAN-CENTRAL NATIONAL





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Gottesman & Company, Inc. • Central National Corporation Central National Commercial Company, Inc. 100 Park Avenue, New York 17, N. Y.

Gottesman & Company Aktiebolag, Stockholm, Sweden • Central National-Gottesman Limited, London, England • Representatives in 55 Leading World Markets

MONTHLY REPORT - WORLD NEWS

CROSS-COUNTRY MERGER ANNOUNCED . . . by Puget Sound Pulp & Timber Co., Bellingham, Wash., and Hopper Paper Co., Taylor-ville, Ill.,—subject to shareholder approval. Puget produces pulp, paper, board, chemicals, lumber and has half interest in Ketchikan Pulp Co., Ketchikan, Alaska. Hopper (to be Puget division) manufacturers fine printing, writing papers at plants in Taylorville and at Reading and Modeana, Pa.

NEW MACHINE FOR WISCONSIN . . . where No. 3 Fourdrinier is producing various grades of glassine at Nicolet Paper Corp., West DePere. Valley Iron Works unit has more than double the capacity of Nos. 1 and 2, produces broader range.

NEWSPRINT CONTINUES RISE . . . with North American production in April at 715,806 tons 2.9% above year ago. At same time, shipments were up 2.2%. First four months' output at 2,860,760 was up 8.3%.

COATING GETS BIGGER . . . TAPPI's 11th Coating Conference drew record 956 registrants. Trailing blade coater still tops interest. Big discussion: merits of on- and off-machine methods. Southern mills continue coating binge as newsprint producers still ponder.

ANOTHER INCREASE IN BOOK SALES . . . reported by American Book Publishers Council Inc. For seventh consecutive year
dollar volume was up—12.6% over 1958,
72% above 1952. Number of copies sold in
1959 stood at 622,163,000—up 12.5%.

CHALLENGE TO HIGH-SPEED NEWSPRINT MA-CHINES... when No. 4 at St. Croix Paper Co., Woodland, Maine, operated 128 continuous hours at 2,085 fpm during week ending May 1. No breaks, no lost time. Web 190 in. wide, 3,033 miles long passed over machine. Record for the mill.

KRAFT PAVES WAY FOR EXPANSION . . . at S. D. Warren Co.'s mill in Cumberland Mills, Maine. Switch from soda to 100% kraft was economical, incorporates highly effective odor-eliminating installation.

DAM TO MAKE MILLS FEASIBLE . . . in northern California, where Beehtel Corp. contracts for engineering work on Mad River project in Trinity county. Will supply water to Humboldt Bay area. Includes Eureka, Samoa, Arcata. Two firms have contracted for water—Georgia-Pacific Corp., Simpson Timber Co. A third, identity undisclosed but reported to be pulp-paper firm, is dickering.

NEARLY \$500,000,000 . . . in paper industry stocks held by 122 investment firms. Holdings represent 2.9% of total assets of members of National Assn. of Investment Companies. Leading list is International Paper Co., with 45 investment firms holding shares valued at \$138,-737,000. St. Regis is second.

NATION HITS NEW HIGH . . . in first quarter production, says U.S. Dept. of Commerce. Total of goods and services was at a (seasonally-adjusted) rate of \$50.2 billion.

MULTIMILLION-DOLLAR EXPANSION . . . is now in progress at Buckeye Cellulose Corp.'s Foley, Fla. mill will increase capacity yearly 33,000 tons (13%). Production includes dissolving and bleached kraft pulps. In addition to increased capacity, program will make possible better efficiency, flexibility. Included: woodyard expansion; extra chipping equipment; two new digesters; increased double-screening capacity; added instrumentation, and modification of newest Fourdrinier.

MOFE THAN \$8,000,000 . . . spent since 1953 by Strathmore Paper Co. in improving, modernizing, expanding facilities at four western Massachusetts communities in which it operates.

SECOND NEW MILL PLANNED IN GEORGIA . . . This one by Dixie Land & Timber Corp. Says President Ken Mason: a \$30,000,000 to \$50,000,000 plant will be built at one of five locations. No news as to type of paper to be produced. Daily capacity: 300 tons. (Southern Land, Timber & Pulp Co. has reported similar plans.)

Fluid Power NEWS

"ANY-SPEED WINDER DRIVE

From Oilgear Application-Engineering Files

HOW OILGEAR "ANY-SPEED" WINDER DRIVE IMPROVED SUPER CALENDER PERFORMANCE AND PRODUCT QUALITY

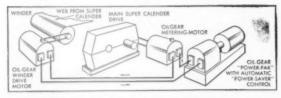
CUSTOMER: A Large Midwestern Paper Manufacturer

DATA: This company had the same problem on a super calender that faces every manufacturer of a continu-ous sheet, strip or web that can be easily torn or broken . . . winder synchronization and tension control for top product and roll quality. Specific job requirements: 1: Use minimum of calender main electric drive power to prevent possibilty of overload. 2: Close tolerance "Any-Speed" synchronization be-

tween winder and calender to prevent loose winding at low speeds, "catch-up" and tearing at high speeds. 3: A minimum top operating speed of 1,000 ft/minute. 4: Dependable, trouble-free, round-the-clock performance. 5: Conserve valuable floor space. This application is a particular challenge, since other drive which provided a high top speed proved uncontrollable on starting take-off.



SOLUTION: An Application-Engineered Oilgear "Any-Speed" Winder Drive System... an Oilgear heavy-duty "Power-Pak"; two series-connected, constant torque, fixed stroke, Oilgear Fluid Power motors; an Oilgear automatic, adjustable, winder tension valve. This installation easily surpassed all specified requirements and bear or provided and support of the control of the co This installation easily surpassed all specified requirements, and has operated on a continuous 24-hour schedule for over 3 years with no reported major maintenance. User Reports — this winder drive has assured consistent production of high-grade finishes, good roll quality, and reduced over-all cost of machine operation. Due to constant, "Any-Speed" synchronization and unvarying tension on the paper web in the super calender stacks, "break-fold" marks on soft calender rolls have been virtually eliminated — resulting in longer calender roll life. Costly roll refinishing and machine downtime are sharply reduced. machine downtime are sharply reduced.



OPERATION: Oilgear Variable Displacement Pump with Automatic "Power-Saver" Control (4) supplies Fluid Power to metering-motor (1) — "tied" to main super calender drive. In this way, metering-motor (1) tends to boost main calender drive power rather than taking power from it. Starting a new roll, series-connected winder-motor (2) must run at high speed, requiring high volume at low torque (pressure). As roll diameter increases, proper web tension is maintained over a wide core-to-full-roll ratio by automatically increasing torque (pressure), and decreasing volume. Automatic web tension control is fully adjustable.

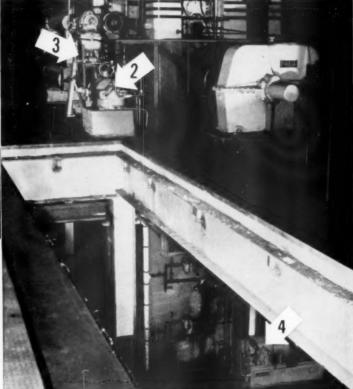


Photo upper left shows Oilgear metering-motor (1) to right, as connected with main calender drive. Winder-drive motor (2) and back panel for automatic, adjustable, winder-tension control (3) can be seen in background. Photo above shows Oilgear heavy-duty "Power-Pak" (4) installed in basement beneath super calender to conserve valuable floor space. Also shown are Oilgear winder-drive motor (2), and automatic, adjustable, winder-tension control panel (3). panel (3).

Whether you need constant or automatic tapering tension constant or automatic tapering torque, or a combination of torquetension characteristics...there's a dependable, Oilgear "Any-Speed" drive to meet your requirements.

Users in every industry claim — "for lowest-cost-per-year...it's Oilgear!"

For similar practical solutions to YOUR linear or rotary drive and control problems, call the factory-trained Oilgear Appli-cation-Engineer in your vicinity. Or write, stating your specific requirements, directly to . . .

THE OILGEAR COMPANY

Application-Engineered Controlled Motion Systems 1592 WEST PIERCE STREET . MILWAUKEE 4, WISCONSIN

MONTHLY REPORT - WORLD NEWS

WORLD'S LARGEST PRODUCER . . . of coated publication, catalog papers under one roof will be possible distinction of Kimberly-Clark Corp.'s mill at Neenah, Wis., with completion of current expansion. Program includes new coated printing paper machine with 170-in. wire and construction of additional mill facilities. Machine will be equipped with K-C's own trailing blade process, will have yearly capacity of 50,000 tons.

ONE-PICA CHANGE IN NEWSPAPER COLUMN WIDTH . . . cut newsprint demand by 312,000 tons in 1959, says Newsprint Information Committee. Tonnage valued at \$42,000,000. As of 1959, some 55.6% of U.S. dailies had narrowed their columns.

NEARLY ONE BILLION CU. FT. . . . of Lake States timber are destroyed annually by diseases, insects and fire. Without these losses, growth would approximately double, says Lake States U.S. Forest Experiment Station. Most dangerous culprit: heart-rot fungi.

NOT OBLIGED TO DEFEND . . . Pulp and paper that show substantial profit should be proud of their performance and not obliged to defend themselves, say two figures prominent in British Columbia's forest industry-M. J. Foley, president, MacMillan, Bloedel & Powell River Ltd., and John R. Nicholson, president, Forest Industries Council. "Criticism of profits betrays ignorance on the part of the critic, " said Mr. Nicholson. "Without profits, there would be no industrial expansion and greatly reduced funds for social services."

HARDWOOD FOR LINER BOARD . . . will be utilized at 150-ton semichemical mill to be constructed by the Terre Haute (Ind.) div., Weston Paper & Mfg. Co. Construction supervised by Rust Engineering Co.

NEW HIGH IN PULPWOOD USE . . . recorded in 1959 at Packaging Corp. of America's American Box Board div., Filer City, Mich. Nearly 225,000 cords were consumed, up 26% from 1958's previous high of 181,000.

LABOR COST UPPED IN WEST . . . where employes approve uniform agreement extending to June 1, 1961. Terms provide wage and fringe package boost amounting to 12 1/2¢ per hour—including a 3 1/2% general increase. Agreement applies to United Papermakers & Paperworkers and International Brotherhood of Pulp, Sulphite & Paper Mill Workers.

HOPSCOTCHING THE NORTH AMERICAN INDUSTRY . . Consolidated Water Power & Paper Co. will erect coating preparation plant at Wisconsin Rapids div.; carbonate as well as starch and clay will be handled in bulk at \$1,000,000 plant. . . Georgia-Pacific Paper Co. will build a converting plant—the firm's first—in the Pacific Northwest; installed will be "the latest high-speed combiners, a full range of corrugated box-making machinery. . . . Riegel Paper Corp. plans a 150,000-sq. ft. plant for Quality Lithographing div. in Atlanta; \$2,000,-000 facility will eventually convert an annual 18,000 tons of paperboard. . . .

MORE ABOUT THE INDUSTRY . . . Weyerhaeuser Co. has opened branch office of Research div. in Seattle to (1) study problems relating to all timber products and (2) undertake research in building materials. . . Michigan Carton Co., Battle Creek, forms Egg-Cel div. to promote and sell new line of pictorial egg cartons, lease and install equipment for setting up and sealing folding egg cartons. . . . Flintkote Co. has purchased Sealzit Co., Riverside, Cal., for more than \$1,000,-000; Sealzit makes equipment for application of resins, binders, plastics. . . . Union Bag-Camp Paper Corp. awards contract to Black-Clawson Co. for rebuild of No. 3 at Savannah, Ga.; new unit will be 236-in. Hydroflyte cantilever Fourdrinier. . . Gulf States Paper Corp. establishes at Maplesville, Ala., E-Z Pak Co. to produce complete line of folding paper cartons, trays and plates. . . . Calcasieu Paper Co. Inc. making Clupak at its face-lifted mill in Elizabeth, La.; extensible unit installed on 162-in. No. 3 to produce wide variety of kraft at about 150 tons per day. . . .

Which of these 3 products and services can you use from BECCO?

New Cold Caustic Bleach Process

Looking for a way to use greater amounts of low-cost, more plentiful pulp-without capital investment for bleach equipment? Then let a Becco Sales Engineer show! you our new technique® which allows you to bleach in the same equipment regularly used for the manufacture of cold caustic pulp.

In this new process, peroxide bleach liquor is added at the Bauer Refiner, and bleaching occurs during the refining operation. Bleach response depends on refiner densities.

Up to 20 points brightness increase has been obtained in commercial operations to date. and with no additional steam costs, no holding time, and no excessive chemical costs.

Becco can assist you immediately in setting up a production run and evaluating results. First step: use the coupon to let us know you're interested.



Bleach Plant in a hurry?

By now, you've probably heard about Becco's Dryer Steep Bleaching Process for insuring brightness permanence by spraying Hydrogen Peroxide across the pulp sheet ahead of the dryers. And you probably know that although the process is patented, Becco will grant a perpetual license for just \$1.00.

But there may still be a question in your mind as to how you can prove this out in your own mill how you can set up a bleach plant in a hurry.

Becco has the answer to this, too. We'll be glad to provide you with a complete "bleach-plant kit" -for as long as you need it-consisting of all the equipment needed to make up peroxide bleach liquor and spray your production sheet.

Here's an opportunity for you to prove to yourself, quickly and easily, that this Becco process will maintain your layboy brightness level - even improve it - through shipping and delivery.

If you'd like to take us up on this offer, drop us a line, or mail the coupon below. And of course, even after we demonstrate, you incur no obligation.



TECHNICAL BULLETINS

We got 'em-You can have 'em! They're FREE!

Years of experience in paper and pulp processing have produced a library of technical information which is available in individual bulletins, free on request. Use the coupon below to let us know which you'd like to receive.

- No. 31 Groundwood Bleaching Variables - A Statistical Approach.
- No. 32 H2O2 Bleaching of Chemicals and Mechanical Pulps.
- No. 47 Peroxide Bleaching of Pulps.
- No. 48 High-Density Pulp Bleaching.
- No. 64 Development Studies on Last-Stage H2O2 Bleaching of Alkaline Pulps.
- No. 65 Peroxide Bleaching of Southern Pulps.
- No. 66 Becco Laboratory Procedures for Pulp Bleaching, 1955 Ed.
- No. 91 Peroxide Bleaching of Chemi-Mechanical Hardwood Pulps.
- No. 92 Peroxide Bleaching of Chemical Pulps.

BECCO fine



BECCO CHEMICAL DIVISION, FMC Station B, Buffalo, New York

Dept. PP-H

Please have a Sales Engineer give me more information on Becco's Cold Caustic Bleach Process.

ADDRESS CITY.

STATE ZONE

BECCO fine



BECCO CHEMICAL DIVISION, FMC Station B, Buffalo 7, New York

Gentlemen:

Dept. PP-J

Yes! We need a "bleach plant in a hurry". Please send us more information about Dryer Steep Bleaching.

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BECCO CHEMICAL DIVISION, FMC Station B, Buffalo, New York

Dept. PP-G

Gentlemen:
Please send me a copy of each of the following bulletins:

FIRM.

_STATE

MONTHLY REPORT - WORLD NEWS

SWISS CAPITAL REPORTED BEHIND PROPOSED PULP MILL . . . in British Columbia's Peace River Country. Gordon Moore, head of Fort St. John Lumber Co., is negotiating project.

PULP MILL FOR BRITISH GUIANA . . . Site clearing underway at Wolfson City, 45 miles from Georgetown, for 500-ton per day dissolving and paper mill. Being built by Columbium Corp., financed by Italian interests. Will draw from 500,-000 acres of hardwoods—including wallaba tree.

COMMON MARKET COUNTRIES PREDICT 12-15% INCREASE . . . in paper consumption this year over 1958. Forecast (in metric tons): W. Germany—up 3,900,000 to 4,000,000; France—2,500,000 to 2,540,-000; Italy—1,450,000 to 1,480,000; Netherlands—850,000 to 870,000; Belgium-Luxembourg—530,000 to 550,000.

COMMON MARKET SPEED-UP . . . France, West Germany, Italy and the Benelux Union were to meet in May to approve modified plan for acceleration of internal dismantling of duties, and to begin formation of a common external tariff 18 months ahead of schedule set in Rome Treaty. Start of speed-up plan expected in October.

IN ANOTHER EUROPEAN TRADE MOVE . . . the Outer Seven (EFTA Convention) became official May 3. Group (Austria, Britain, Denmark, Norway, Portugal, Sweden, Switzerland) was formed following breakdown of efforts to link six-nation Common Market to other European nations.

FINLAND PLANS LARGE SULFATE PULP MILLS
... Enso-Gutzeit Oy will build at Harakka and is considering second at Joensuu
in newly-created Narth Karelia province.
Construction of former (150,000 tons) is
to begin shortly, and kraft paper production may be added at later date. Annual
capacity at Joensuu would be 100,000
tons.

BELIEVED TO BE EUROPE'S LARGEST . . . beta ray thickness gauge has been shipped to Oy Control AB Co. (Finland) by Tracerlab

Inc. (U.S.A.). Unit will be installed on large paper machine, is capable of checking—from edge to edge—thickness uniformity of 20-ft. web in process.

NEW KRAFT LINER MILL . . . at Munksund, north Sweden, will go into operation in spring 1961 with annual capacity of 100,-000 metric tons. Builder is Svenska Cellulosa AB. Beloit (U.S.A.) machine will have 685-cm wire, trim width of 630 cm (248 in.). Output will include all current basis weights from 100 to 500 gr. per sq. meter.

BIGGER EARNINGS IN PERU . . . where W. R. Grace & Co. reports net income in paper operations of \$14,827,290, some 48% higher than in 1958. Fifth paper machine is to be installed this year at Paramonga mill to produce bleached papers. (Peruvian raw material for paper is bagasse.)

80,000-TON INCREASE IN TWO YEARS . . . is forecast for Yugoslavia's paper and board industry. Hoped-for exports by 1961: 20,000 tons.

PAPER AND PULP MACHINERY IMPORTS DOWN
... in Norway. 1959 value was 22,600,000 Crowns, compared to 34,900,000 the
year before.

ITALIAN PRODUCTION UP . . . in first 11 months of 1959, when output stood at 1,-162,469 metric tons, compared to 997,802 in same 1958 period.

MORE FAVORABLE EXPORT-IMPORT FLOW . . . is sought by U.S. business through Foreign Trade div., Dept. of Commerce. In recent meetings pulp-paper has had prominent role. Big question: How can U.S. producers overcome "restrictive measures" against some of its products?

EXPORT-IMPORT BANK AUTHORIZES . . . \$1,500,000 loan to CA Venezolan de Pulpa y Papel to help finance construction of pulp and paper mill at Caracas, Venezuela. Equipment manufactured in U.S.A. will be installed.



Introducing-

THOR HDNF TRANSMISSION BELTING

- muscled with nylon fill fabric

Here's transmission belting that offers greater strength for the long pull-greater flexibility for the short turn.

It's the new THOR HDNF — built with newly developed compounds teamed with Heavy Duty Nylon Fill fabric for capabilities never before found in belting of this type.

You get greater flex-life in installations involving small pulleys running at high speeds.

You get up to 100% greater fastener-holding ability.

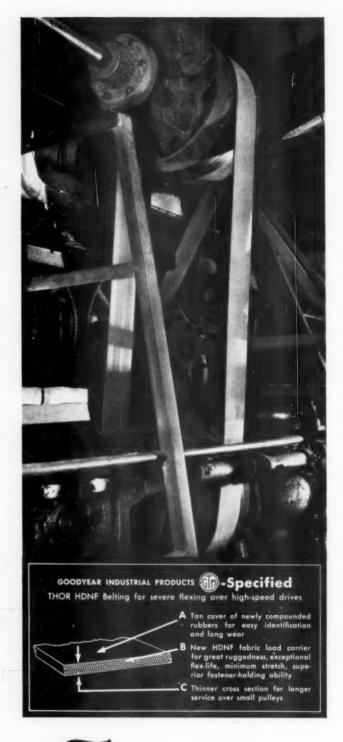
You get low stretch.

You get premium horsepower ratings.

And you get all this in an attractive new tan belt that's easily identified throughout its longer-than-ever service life.

For the rest of the story of this new standout in the standout line of Goodyear transmission belts, check with your G.T.M. — Goodyear Technical Man — through your Goodyear Distributor. Or write:

Goodyear, Industrial Products Division, Akron 16, Ohio.



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WORLD PULP & PAPER

Technical News

Glucose Degradation—Russia

SAPOTNITSKII, S. A., and MOSKALEVA,
 A. G. Zhur. Priklad. Khim. 32, no.
 7: 1586-90 (July 1959). [Russ.]
 A. B. I. P. C. 30:929.

Laboratory sulfite cooks of 0.165 and 0.211 M glucose solutions were carried out at 140 and 150° C for varying lengths of time up to 14 hr. in the absence and in the presence of 0.3-1.7 moles of an aromatic or an aliphatic aldehyde (vanillin, benzaldehyde, acetaldehyde or formaldehyde) per mole of sodium hydroxide. The aliphatic aldehydes did not prevent the degradation of glucose but considerably reduced its rate. The rate of glucose degradation was practically the same in control cooks and in the presence of aromatic aldehydes. The curves representing the percentage of glucose degradation as a function of the aliphatic aldehyde concentration had a minimum at a 1:1 aldehyde:base molar ratio. The glucose degradation vs. time curves for the two aliphatic aldehydes ran parallel to the corresponding control curves and were nearly straight lines. In the presence of aliphatic (but not aromatic) aldehydes the oxidation of sulfur dioxide to sulfate ion was considerably inhibited.

Bark in Board-Japan

MURATA, TOKITSU, and TAKAMURA, NORIO. J. Japan Wood Research Soc. 5, no. 5: 194-9 (Oct. 1959). [Jap.] Abstr. Bull. I. P. C. 30:950-1.

The effect of bark additions on the properties of wet-process hardboard from eight wood species was studied. The wood included red pine (Pinus densiflora), cedar (Cryptomeria japonica), fir (Abies firma), spruce (Picea excelsa), beech (Fagus crenata), poplar (Populus maximowiczii), birch (Betula maximowicziana) and linden (Tilia japonica). Typical bark contents were 12.5% for fir and spruce, 15.4% for birch, and 17.7% for poplar. Mixtures of wood and bark containing 0, 10, 30, 50 and 100% bark were pre-steamed for 4 min. and fiberized in a laboratory Asplund defibrator for 1 min. under 10 kgm/sq. cm. steam pressure. After refining in a Sprout-Waldron laboratory refiner, the pulps were sheeted in a 23- × 23-cm. forming box without sizing agent and pressed to about %-in. thickness at 180°C. Although 70-90% of the bark Presented with permission of The Institute of Paper Chemistry, under supervision of Curtis L. Brown, editor of IPC Bulletin. Photostats or translations of original reports available at reasonable cost by writing Eugene Bunker, librarian, Institute of Paper Chemistry, PO Box 498, Appleton, Wis., U.S.A.

components remained in the pulp, increasing the bark content of the charge lowered the pulp yields obtained. At the same time, the power requirements for fiberizing and especially for refining were reduced as the bark content increased; power savings were greater for softwood than for hardwood barks. No difficulties in sheet formation were encountered with mixtures containing less than 30% bark, except with fir and spruce, which showed a steep rise in freeness with bark additions above 10%. Except for cedar and linden, pulps of 100% bark fiber could not be pressed, because of dewatering troubles and because of fibers sticking to the caul plate and back screen in the hot press. Increasing the bark content lowered the modulus of rupture in bending; except that of linden hardboard, which was not impaired even with 50% bark added, probably because of the strong phloem fibers. With increasing bark content, water repellency was lowered in cedar and fir but was slightly improved in hardwood boards and greatly improved in red pine hardboards.

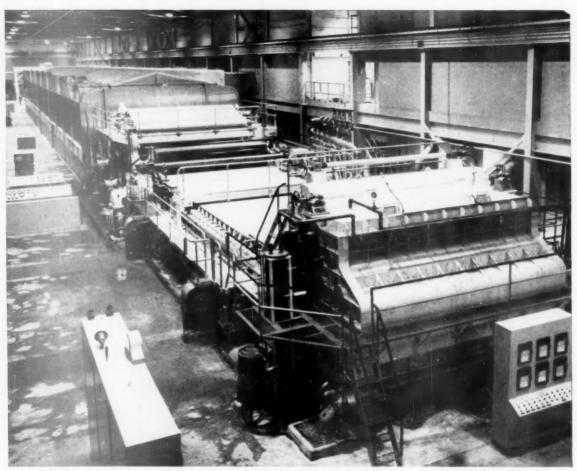
Folding Box Crush Resistance

DAGEL, YNGVE, and WESSMAN, GUN-Verpackungs-Rundschau 10, NAR. no. 12: Suppl. 89-95 (Dec. 1959). [Ger.] Abstr. Bull. I. P. C. 30:910. The crush resistance (I) of folding boxes was studied as a function of the strength properties of the boxboard. For boxes of given dimensions, it is shown theoretically that the I depends only on the stiffness of the board in both directions. This theory was confirmed by measurements on boxes of various dimensions and made of different board qualities. For best utilization of board strength, the machine direction of the board should run parallel to the direction of the load acting upon the finished carton. The bulging of cartons filled with pulverulent materials was studied as a function of box dimensions and board properties. It is shown theoretically that the degree of bulging is proportional to a rigidity factor and to the fourth power of the box length, but further experiments are needed to determine the exact relationship and the effect of creasing.

NSSC Pulping

FELLEGI, J., and JANCI, Papír a celulosa 14, no. 5: 99-102 (May, 1959). [Slovakian], Abstr. Bull. I.P.C. 30: 214.

Beechwood NSSC cooks made at a constant sodium sulfite content of 25.2% showed that with increasing ratios the pulp yield and lignin content are increased, but the pulp brightness is lowered as the liquor: solids ratio is increased from 5: 1 to 10: 1 and 20: 1. This effect is explained by differences in the concentration gradients and hence in the diffusion rates between the chips and the liquor. In practice, a reduction of the liquor: solids ratio can be accomplished by partial withdrawal of liquor after thorough impregnation of the chips. Such a procedure does not reduce the theoretical consumption but does reduce the practical consumption of sulfite, since the chemicals in the liquor withdrawn are utilized for the impregnation of a fresh charge of chips. Withdrawal of 35-50% of the liquor in beechwood cooks and of 20-30% in poplarwood cooks has no detrimental effect on the mechanical properties of the pulp, but rather increases it breaking length and folding endurance. Complete withdrawal of the liquor (cooking in the vapor phase), although technically convenient because of low chemical consumption and shortened cooking time, lowers the mechanical strength of the pulp, apparently as a result of the accumulation of reaction products within the chips. However, the reduction of mechanical strength by vapor-phase cooking was lower in popularwood pulps, indicating that wood composition and impregnability can be important factors. The advantages of NSSC pulping with partial liquor withdrawal include reduced sulfite and steam consumptions, shortened cooking times, and increased dryness and heat of combustion of the spent liquor.



#6 Fine Paper Machine
at Howard Smith-Cornwall was
built by Dominion Engineering and
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It incorporates many new design features.



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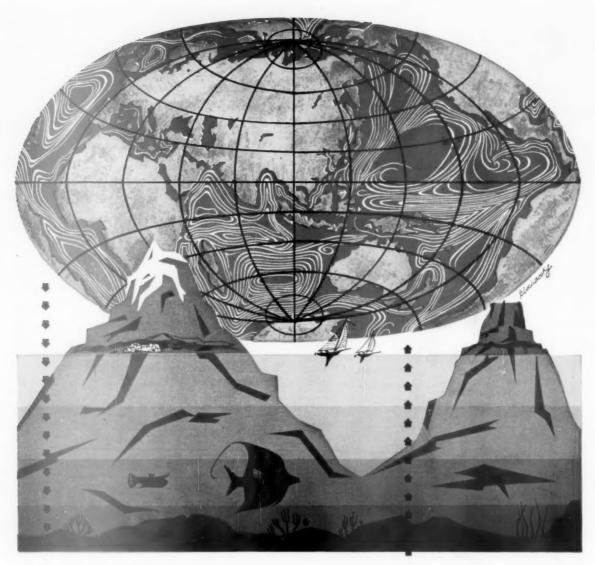
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HIGHER VOLUMES
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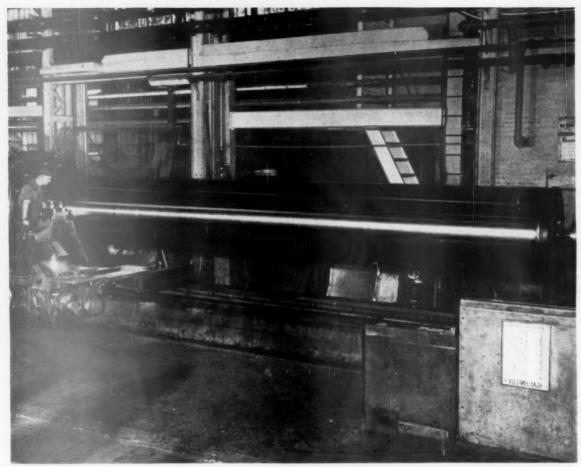


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21-ton Nickel stainless steel roll stays smooth, provides improved suction

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 $\ensuremath{\mathsf{BECAUSE}}$ THEY'RE FLEXIBLE, new Crane Flex Gates seat with less torque.

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BECAUSE THEY'RE FLEXIBLE, minor deflection of seating faces due to pipe strains does not affect tightness of Crane Flex Gates.

BECAUSE THEY'RE FLEXIBLE, new Crane Flex Gates are tight on inlet seat and outlet seat over a wide range of pressures.

BECAUSE THEY'RE FLEXIBLE, new Crane Flex Gates can be used singly in some services where two conventional gate valves are frequently specified. You can save substantially on piping costs.

BECAUSE THEY'RE FLEXIBLE, new Crane Flex Gates can be serviced—body seat rings replaced or seating faces

refinished-quickly, and without painstaking accuracy. Slightly off-taper seats do not affect tightness or operating ease.

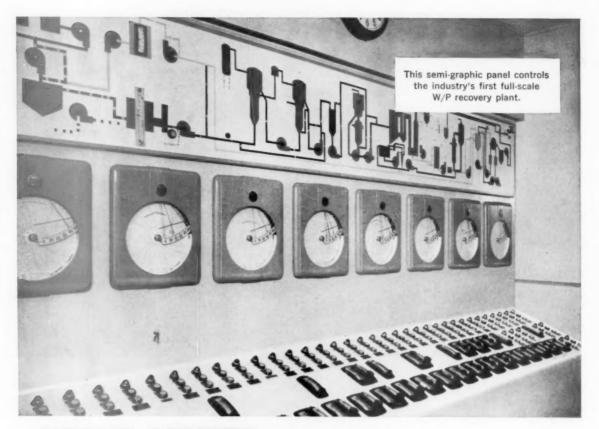
BECAUSE THEY'RE FLEXIBLE, new Crane Flex Gates will easily outperform any conventional solid wedge disc valve you now use. And there's no increase in price.

BECAUSE THEY'RE MADE BY CRANE, these new Flex Gates are completely dependable. You can use them with complete confidence on steam, water, gas, oil or oil vapor service. Stem and disc seating faces are Crane Exelloy. Shoulder-type body seat rings are Exelloy or Crane No. 49 Nickel Alloy. Sizes: 12 inch and smaller; 150- and 300-pound pressure classes.

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NERVE CENTER for first installation of W/P recovery process

This semi-graphic panelboard is regarded as one of the major advances in process instrumentation for the pulp and paper industry.

The reasons:

*A New Process is Involved:

This panelboard is located at the new recovery plant of Consolidated Water Power & Paper Company, Wisconsin Rapids, Wis. It is the nerve center for the first commercial-scale installation of the Western Precipitation Corporation's new recovery process. Long sought by the industry, the W/P system provides a new approach to processing both acid sulphite and semichemical spent liquors.

*Panel Represents Advanced Automation

The panel is no mere mounting for controls, recorders and control stations . . . it provides an exceptionally

advanced degree of intelligence to reduce manpower required in the operation of a highly complicated processing system.

This comprehensive installation is another example of how Bailey is working with pulp and paper processors toward greater degrees of automation, efficiency and quality control.

Put Bailey's 40 years of engineering leadership to work for you. Your Bailey Engineer will be happy to review your plant operation and to suggest applications that will bear immediate return. Check phone book for nearest Bailey District Office, or write direct to our Pulp and Paper Division.

*For further information, write to the Bailey Meter Company for Reprint No. C-30, "Consolidated Demonstrates Its Recovery of Spent Sulphite Liquors."

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PULP AND PAPER DIVISION

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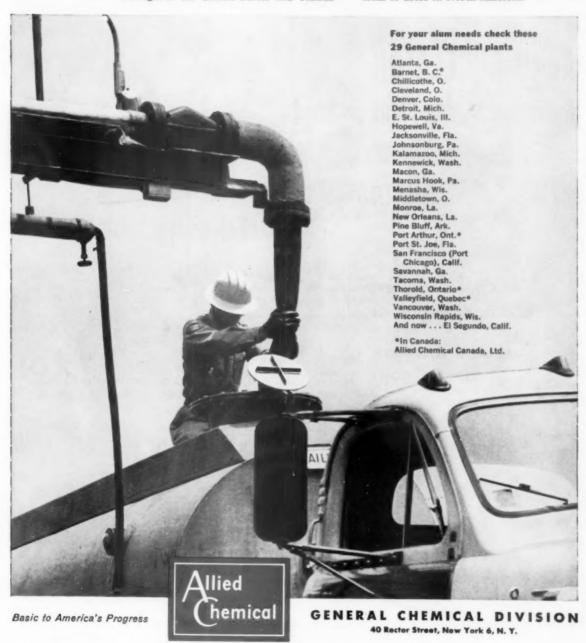
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General Chemical is "on stream" with liquid alum from its new plant at El Segundo, California. Now there are 29 General Chemical plants producing dry or liquid alum for pulp and paper manufacture, water and sewage treatment and other uses. These plants are located where they can serve you best throughout the United States and Canada assuring dependable supply at all times. In addition, General's chain of warehouses makes dry alum available in every major center of commerce. Completion of the new El Segundo plant is another example of General Chemical's more than 50 years of leadership in providing a reliable source of high quality alum to users in North America.





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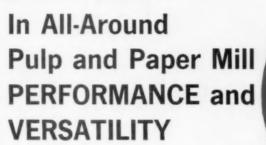
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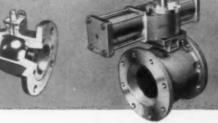


The Jamesbury valve is proving itself in the toughest service in the paper mill . . . Digester Blow installations. The same dependable efficiency, rugged construction and outstanding performance is built into every Jamesbury valve and . . .

There's a Jamesbury ball valve to fit wherever mill applications call for a quick ON-OFF valve, screwed end or flanged type, manually or remotely operated, in the 1/4" through 10"** size range. Jamesbury's range of valve materials is equally impressive: 303 and 316 Stainless Steel, Alloy 20, Carbon Steel, Bronze, Ductile Iron, Aluminum and PVC. Interchangeable seats and seals are available in "Teflon", Nylon, Buna-N, Neoprene, Hypalon and natural rubbers.

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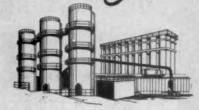
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PULP & PAPER - July 1960

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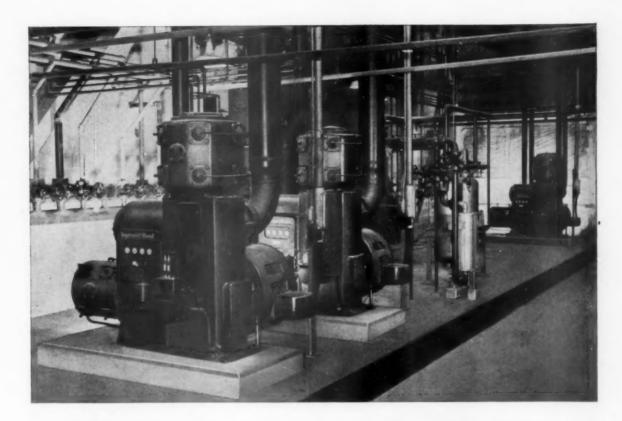
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-75



MORE OIL-FREE AIR NEEDED

Alaska pulp plant uses one-third of air capacity for instrumentation, chooses three Ingersoll-Rand XLE compressors

The growth of air instrumentation in the pulp and paper industries is shown by the new Sitka pulp mill of the Alaska Lumber and Pulp Company, Inc. Previously, most pulp-paper mills have earmarked only 15-20 percent of their total compressed air capacity for this purpose, but the Sitka mill uses a third of its air supply for instrumentation alone.

To provide the air for Sitka, the choice was three Ingersoll-Rand 125-hp XLE compressors—two units for 100-psi general plant air power, and one "NL" non-lubricated compressor for oil-free instrument air. Like other I-R compressors, the XLE offers many extra-value features including running gear which never needs adjustment, sealed frame which keeps out dirt, filtered pressure lubrication to all running parts, and famous air-cushioned Channel Valves. The packaged, ready-to-run construction of the XLE (with pipeless Thru-Frame Air Flow) was a big help in starting the Sitka mill up ahead of schedule!

The XLE-NL instrument air compressor features I-R's exclusive "NL" cylinder construction, which permits long periods of continuous operation without lubrication of any kind. And Ingersoll-Rand NL Channel Valves are the only compressor valves especially designed for non-lubricated operation!

Also at Sitka are a number of other Ingersoll-Rand products, including barometric and surface condensers, over 100 pumps, and other types of I-R compressors.

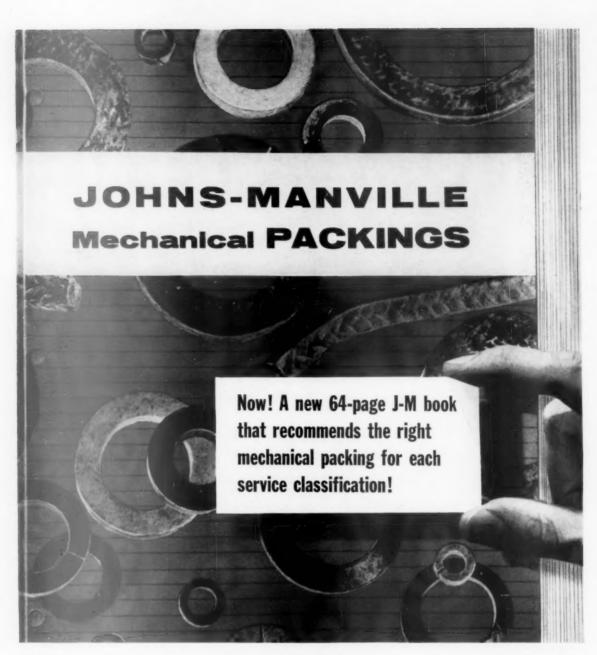
Ingersoll-Rand offers the most complete line of compressors, in reciprocating, centrifugal, rotary and ejector types. There are units from 1/2 to 20,000 hp, for pres-

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This book places years of J-M research . . . knowledge . . . and skill at your service. Because it recommends the best packing practice for each particular application, it can help you get maximum service from your equipment and your packings.

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"Reliance drive to power third machine at Marathon Southern



R. E. Farrell, Application Engineer, Paper Manufacturing, Reliance Electric & Engineering Co.

"Marathon Southern is expanding to provide for a third paper machine; the drive will be Reliance, because of their experience on the first two machines.

"Marathon's No. 1 Yankee tissue machine has a sectional electric drive. The No. 2 paper machine has a Reliance helper drive on the Fourdrinier, presses and size press."

Reliance VSMR electronic regulators and drives control the two paper machines in this mill. The VSMR operates on a dual-circuit 'fail-safe' principle, to assure continuity.

Paper and other industries are well aware that Reliance can give them exactly what they want in drives, motors and controls. Check your nearest Reliance Sales Engineer. He'll give you application and engineering help or, if you prefer, write us direct for information.

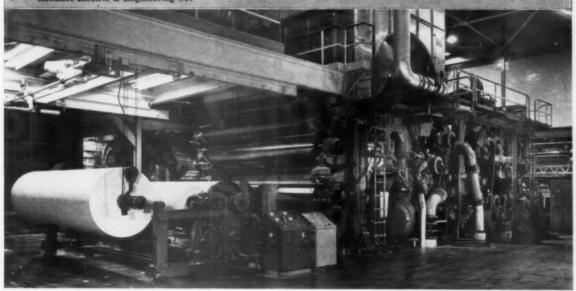
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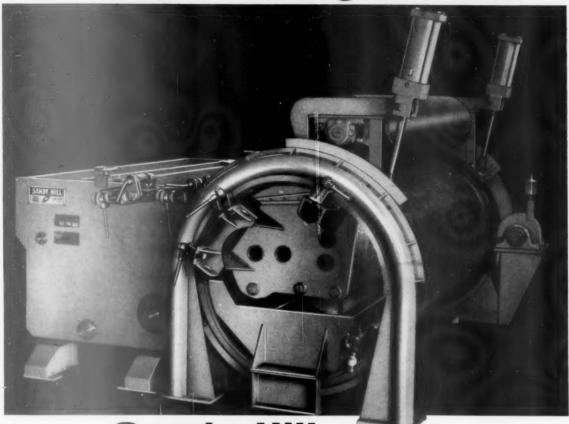


Duty Master A-c. Motors, Master Gearmotors, Reeves Brives, V+S Drives, Super 'T' D-c. Motors, Generators, Controls and Engineered Drive Systems.



PULP & PAPER - July 1960

revolutionary new paper making machine



sandy Hill rotoformer

Development of this remarkable new machine signifies the first major break-through in paper making in 150 years. The Rotoformer combines the best features of the cylinder machine and the Fourdrinier. The 20 Rotoformer units already in successful use clearly indicate their operational simplicity; their unusual ability to give uniformity of caliper across the machine, and their unique adaptability to special products. Learn how this major achievement from Sandy Hill can fit into your operation.

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performance that makes a world of difference

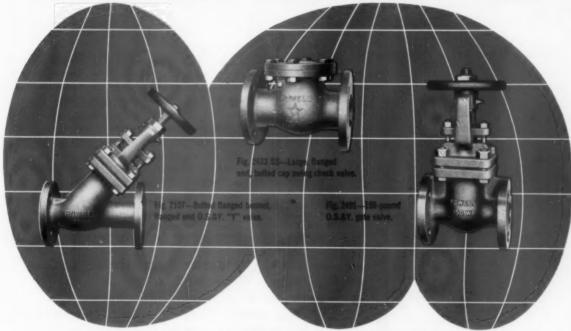
The Powell Special Design and Alloy Valve Division was created to study and solve the flow control problems arising from the increasing number of corrosive fluids used in the Chemical and Process industries.

As a result, Powell has developed valves that can be depended upon for long, uninterrupted service under the most corrosive conditions; valves that require little

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Powell offers valves to handle practically every corrosive fluid—valves of every design and in the largest selection of metals and alloys. Contact your local Powell distributor. Or write or call us direct. Our consulting engineers are at your service.

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THE WM. POWELL COMPANY . DEPENDABLE VALVES SINCE 1846 . CINCINNATI 22, OHIO



GASPESIA NOW HAS CHLORINE DIOXIDE PULP!

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This high-quality new ClO₂ pulp is now being produced in a bleach plant only six years in operation. Space was left for this Chlorine Dioxide operation in the original plant plans. Now, Gaspesia is the only North American sulphite pulp made from northeastern woods bleached in a completely modern bleach plant, utilizing chlorine dioxide.

Gaspesia pulps have long been known for their excellent cleanliness, strength and good forming qualities. Now chlorine dioxide makes possible a brightness of 91 G.E.

Orders for trial cars are now being accepted. We suggest you order your initial shipment today to assure a steady supply in the years ahead.

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... precision built in our new plant for the world's newest mills

Some things are old about these Jones Majestics . . . quality refining results, efficiency of operation and ease of maintenance, for example. But otherwise practically everything else is new . . . like the simplified unit shell construction, the base-mounted scale to indicate plug position, the improved design of bearings, packing glands and Accruset adjusting mechanism. They're the first machines off the production line in Jones' new Pittsfield plant . . . and first choice of the world's newest and finest mills. For full details write to E. D. Jones Corporation, Pittsfield, Mass. Ask for Bulletin EDJ-1036.



New Jones Plant in Pittsfield is one of the largest pre-fabricated steel buildings in the country. In it are incorporated the very latest production methods and facilities to assure Jones' continued leadership in the field of pulp mill equipment and stock preparation machinery.

Canadian Associates:
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Jones

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A PRACTICAL, STEP-BY-STEP PROGRAM FOR INCREASING PAPER MILL EFFICIENCY AND PRODUCT QUALITY

Lurking behind every ton of paper produced today are the problems of rising costs which threaten profits. The paper industry sees an increase in production of over a million tons per year for the next 10 years. If production objectives are to meet market objectives, greater mechanization heads the action list . . . to raise efficiency, emphasize quality control, insure a better profit picture.

Westinghouse Progressive Automation is a step-bystep program to help you achieve a greater measure of automatic production. Progressive Automation is thoroughly practical. Applied to an individual mill, it is an individual plan. Thus, you can reach your goals economically, without over- or under-automating.

Today, Westinghouse is ready to help you plan and execute the next step in a program for automatic production. For many, this will be data logging . . . automatic recording and tape storage, at any preset interval, of information from hundreds of points in the mill. Fast. Errorless. A centralized data center observes functions throughout the plant, so you can make accurate and timely decisions on quality control.

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Progressive Automation has already proved itself with many manufacturers by stepping up production, improving quality, reducing off-grade losses and human error. One of the many rewards realized from automated equipment is more—and better control of—knowledge, both for present paper products and processes and for future product development.

Westinghouse Progressive Automation is flexible and therefore your capital investment is at a minimum. Controls and systems, appropriate to the stage of automation presently achieved in your mill, can be added as needed.

Westinghouse can help you work out a long-range plan of progressive automation . . . and is prepared to recommend, furnish, install and maintain all equipment to fulfill that plan. Today, and for the first time, there is one source for controls, computer systems and all other basic electrical equipment for paper mills. Transformers, switchgear, motors, gearing, drives. Westinghouse is ready to offer you automation, step by step, economically . . . and will assume complete responsibility for system coordination. Call your Westinghouse representative for complete information.

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- DURABLE, SAFE

Pennsalt engineers developed the Dispersed Chlorine System which assures positive, fast, uniform mixing of chlorine gas into pulp slurry.

Atomizing action assures uniform chlorination

The impact of high-pressure water issuing from the nozzle and its atomizing action shatters the chlorine flow into countless fine bubbles, which become trapped and held by fiber bundles until dissolved. Other means of introducing chlorine gas into the pulp flow results in large gas bubbles which promptly re-group into larger bubbles which, on entering the chlorination tower, cause channeling action with resultant uneven pulp chlorination.

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Crown Zellerbach Corporation, Camas, Wash.

Longview Fibre Co., Longview, Wash.

MacMillan, Bloedel, and Powell River Co., Ltd., Harmac, B. C.

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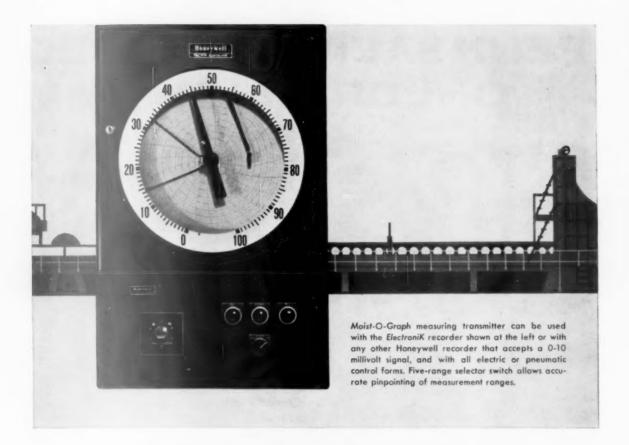
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New MOIST-O-GRAPH IV moisture control system matched to high-speed paper processes

The new Moist-O-Graph IV moisture control system features fast control response to meet the requirements of high-speed processing, and flexibility for custom-fitting to your exact requirements.

Heart of the system is the new Moist-O-Graph transmitter, which contains the entire measuring circuit, and is compatible with any Honeywell recorder and recorder-controller that accepts a standard 0-10 millivolt signal. This means that you're not limited to one or two types of control. Now you can match your process with any Honeywell control unit, such as pneumatic proportional with reset; electric proportional position, or proportional current, with reset.

The Moist-O-Graph transmitter measures extremely low electrical resistances, and can therefore accurately measure high moisture content—even that of many wet materials. New design features minimize effects of static electricity, so that low moisture content can be measured.

Mount recorders in the *Moist-O-Graph* system anywhere. Modular design and plug-in components make the system easy to maintain. Get complete details from your nearby Honeywell field engineer. Call him today . . . he's as near as your phone.

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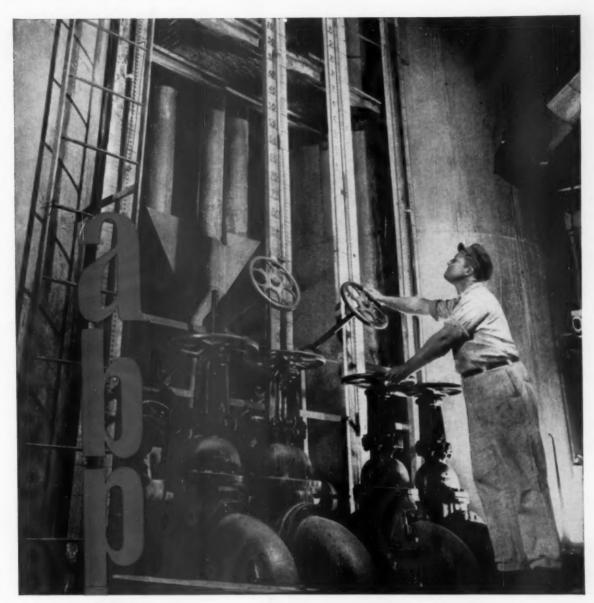
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For specifications and local offices, see our insert in Chemical Materials Catalog, pages 475-482 and in Chemical Week Buyers Guide, pages 37-44.

PULP & PAPER - July 1960

Maximum in the In D **HOW IT WORKS** Each drive motor operates on generator voltage control. The motor speed is measured by a tachometer whose output voltage is compared with the over-all machine's constant reference voltage. With even the slightest difference between the two voltages, the silicon controlled rectifier responds instantly to change the generator voltage and the speed of the drive motor.

operating reliability palm of your hand

Silicon controlled rectifiers now make General Electric paper-industry drives more dependable than ever before

Only two years after their development by General Electric, silicon controlled rectifiers (SCR) have been field-proved and are ready to give your paper-machine drive systems maximum reliability and maximum speed of response.

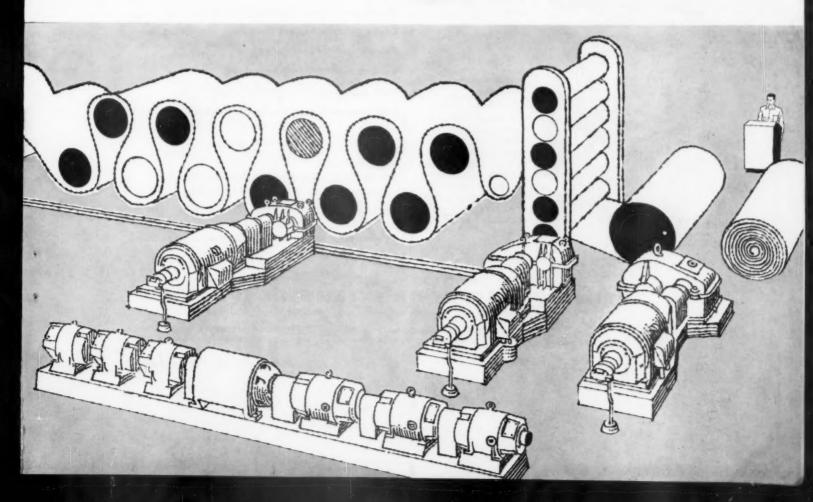
THE SILICON CONTROLLED RECTIFIER, a solid-state semiconductor, provides the same power amplification in speed-regulating systems as magnetic amplifiers, electronic power tubes, and rotating amplifiers. However, the SCR is more reliable and has an almost infinite life. It responds faster and makes possible simpler over-all circuitry. Additionally, the SCR is only one-fifth the size of the electronic tube—previously the smallest power amplifier available.

THE SCR WAS INTRODUCED to the paper industry during October 1958, in a General Electric off-machine-coater drive system. This highly successful installation has since been followed by SCR-equipped sectional drives, winder drives, and an on-machine coater drive. Experience has confirmed the advantages of SCR: faster and more accurate speed control, isolation from a-c voltage changes, and reduced drive-system maintenance and downtime.

Call your local General Electric Apparatus Sales Office for detailed information on how silicon controlled rectifiers make G-E paper-machine drive systems more reliable than ever before. General Electric Company, Schenectady 5, N. Y.

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Now you can get your paper to your customers in top condition at less cost to you

Two simple concepts, shown below, make it possible for paper mills to get their paper to their customers in excellent condition, yet reduce packaging costs. Back of this development lie years of work and experimentation by Signode with the patient cooperation of many leading mills.

An important ingredient in the successful application of the Signode centralized strapping and compression strapping is the Signode way, which includes cooperative consultant engineering service from Signode paper specialists. These men know some very valuable (to you) tricks of their trade. They are in addition to and work together with our regular field engineering, testing laboratory, and sales representative staffs.



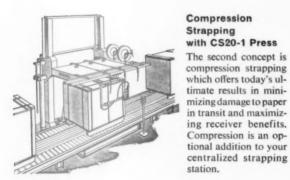
Centralized Packaging with Jib or Bridge Crane

One of these concepts is the centralized packaging station. Signode's specialists in paper packaging are available, at no cost, to help re-arrange product flow in a practical way within existing space limitaHere are some of the advantages you and your customers can expect from strapping the Signode way. You'll get them even without compression, but to a greater degree with compression:

Packaging material savings

Compression Strapping with CS20-1 Press The second concept is compression strapping which offers today's ul-

Reduction in paper slippage in transit Better moisture content control Fewer customer complaints Receiver can triple-deck his paper More usable sheets per skid of paper Less downtime in your customers' plants



A documented analysis of centralized strapping stations and compression strapping is ready for presentation to you. If you don't do anything, a Signode man will be knocking on your door in due time. If you wish to get him there sooner, or want to make sure you are present at the presentation, just let us know.



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"ESCO STAINLESS FITTINGS help us fight Corrosion"

states Carl Carlson, plant manager for Chipman Chemical Company, Portland, Oregon.

"We have found ESCO cast alloy 45S fittings to be of consistently excellent quality. They give us the kind of service we expect from a high quality stainless steel."

"We use ESCO fittings extensively throughout our plant", continues Carlson, "where we manufacture 2,4D and other weed killers as well as many fungicides and insecticides."

Production of 2,4D is a highly corrosive process. Aqueous salts of organic acids, combined with hydrochloric acid, flow through the fittings at temperatures up to 250°F. and at pressures up to 100 psi.

ESCO cast fittings and flanges are available from local ware-house stocks in a complete range of types, sizes and alloys to help solve your corrosive problems.

Call your nearby ESCO representative today for details, or write direct. Ask for ESCO Fittings Catalog 156, and ESCO Alloy Notebook No. 7, "What is Corrosion?".





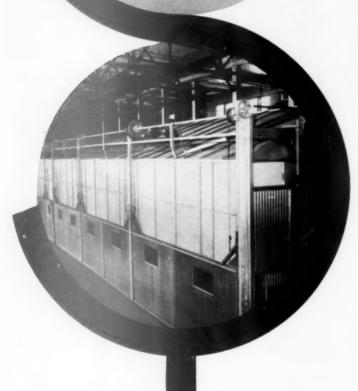


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If you have an open hood over your dryer section, check with ROSS on a conversion job to enclosed hoods. Our engineers will study your machine layout and give you a savings estimate. Here's an economical way to cut steam costs and get greater production out of your present equipment.



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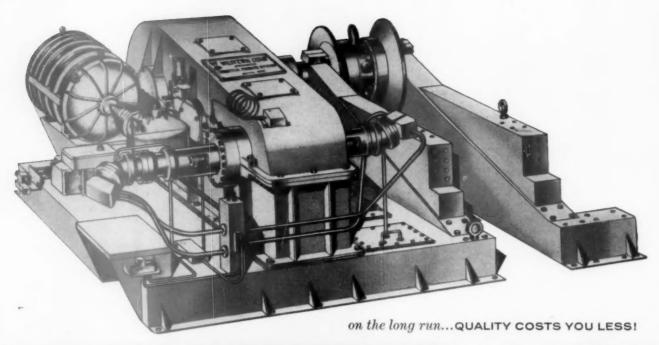
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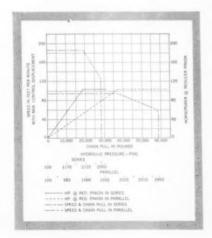
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ANOTHER WESTERN GEAR "FIRST"...ELECTRO-HYDRAULIC LOG HAUL DEVELOPED FOR ALASKA LUMBER & PULP COMPANY



The electro-hydraulic log haul pictured here, unique among the 175 gear drives supplied for the new mill embodies a new concept developed by Western Gear engi-



Operational requirements were:

48 ft. of rise in 220 ft. of haul; maximum chain pull not less than 50,000 lbs. nor more than 65,000 lbs; haul 200 ft. of 24" diameter logs at 120 ft. per minute.

Extra measures of quality that made this design the most practical and economical choice over all other log haul drives are:

- Infinite speed variation from 0-185 FPM permits continuous maximum mill flow regardless of variable debarking time.
- 2. Horsepower Limiter Control automatically adjusts for maximum preset horsepower to allow full capacity operation regardless of load.
- 3. Absence of shock loads. Electric motor runs continuously, softer starting of hydraulic drives eliminate major service problem.
- 4. Positive Overload Protection. High response relief valve removes pressure to motor, instantly sets fail-safe hydraulic brake.

5. Unitized Construction integrates base, valve components and piping into protected self-contained package, completely tested at factory.

The considerable knowledge of marine electro hydraulic deck machinery combined with their background in power transmission equipment and log haul was invaluable in the Western Gear development of this important new concept of log haul design.

Western Gear's experience in electrohydraulics and infinitely variable speed power transmissions can solve your drive problems. For full information, write, wire or phone:

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PARALLEL SHAFT REDUCER



VERTICAL SHAFT REDUCE



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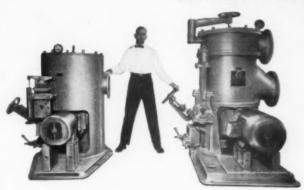
RIGHT ANGLE REDUCER

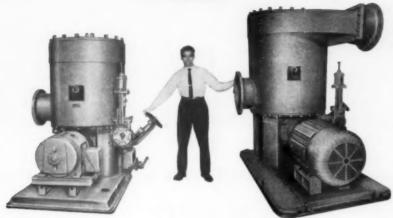
Every Size Paper Machine—any capacity Pulp Mill

Can benefit from



Pressurized Screening





4 SELECTIFIER® SCREEN SIZES COVER ALL APPLICATIONS

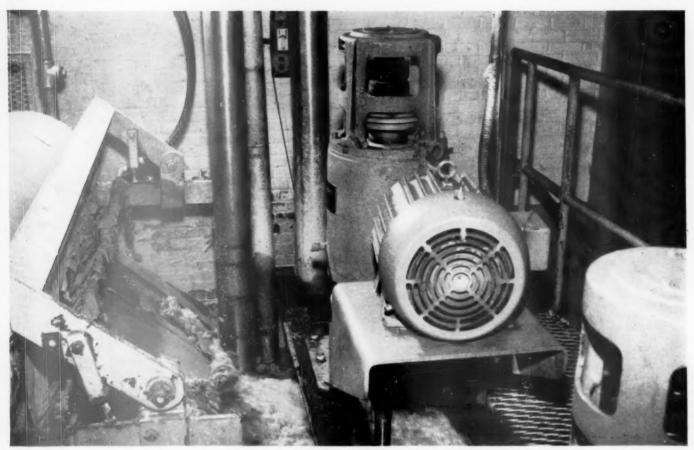
- Model 12-P 1200 GPM—for low tonnage Fourdriniers and individual vat application on small capacity cylinder machines
- Model 24-P 3800 GPM—used on all paper grades—and in pulp mill hot stock refining and pressure washing systems
- Model 30-P 5700 GPM—Intermediate size...economically suited to many pulp and paper mill conditions
- Model 36-P 9000 GPM—Best for wide, high speed Fourdriniers and high capacity pulp mills.

All models deliver the well-known Selectifier Screen benefits
Increased Production • Improved Formation • Cleanest Sheet
Least Maintenance • Longer Felt & Wire Life

Have your Shartle Sales Engineer give you full information

The Black-Clawson Company, Shartle Division, Middletown, Ohio

Single Source for Stock Preparation Machines and Systems BLACK-CLAWSON



Controlled turbulence created by LIGHTNIN Stock Agitator rapidly separates stock fibers at Gould Paper Co., Lyons Falls, N. Y.

How to make stock uniformity toe the mark

This repulping system gives the mill a tight rein on stock consistency and pH.

Here you see step one. Hardwood stock at a soggy 12% consistency drops from the washers into both ends of a 32-foot-long dilution chest. The tiled chest is 4 feet wide and carries a 4-foot stock level.

Incoming stock meets a stream of acid water recycled from the secondary washer. In each 6-foot-long end section of the chest, the turbine on a 15-hp LIGHTNIN Stock Agitator drives stock and water in a powerful mixing flow.

With this kind of agitation, fiber

length and freeness are essentially unchanged. Controlled turbulence does the work of separating the fibers.

Consistency anywhere in this part of the chest stays within 0.1% (bone dry) of the average. Retention time is four minutes.

Rapid pH control Next, uniform stock tumbles over a weir into the 20-foot-long center zone of the chest. Here two more LIGHTNIN Agitators rapidly disperse strong sulfuric acid to bring pH to 2.5 and hold it there as stock discharges to the secondary washer. Uniform consistency and acid-

ity are provided at all conditions up to the design maximum of 4.0% (b.d.).

This MIXCO-designed system was delivered to the mill just five weeks after the day it was ordered. It is only one example of the precision control you can bring into your pulping and paper-making operations with LIGHT-NIN Agitators in your chests.

To find out more about this kind of mixing and the guaranteed results it gives you, call in your LIGHTNIN representative now. His name is in Thomas' Register and in the yellow pages of your phone directory. Or write us.

MIXING EQUIPMENT Co., Inc., 141-g Mt. Read Blvd., Rochester 3, N.Y. In Canada: Greey Mixing Equipment, Ltd., 100 Miranda Ave., Toronto 19, Ont.



Dilution chest has repulp sections at ends, pH-control section in center. Installation adapts easily to changes in mill requirements.



PNEUMATIC UNLOADING AND CONVEYING BY

ALLEN-SHERMAN-HOFF

Fast, efficient unloading of materials and their transportation to storage was engineered into this pneumatic conveying system by Allen-Sherman-Hoff. Although designed for a new plant, this system can easily and economically be adapted to existing facilities.

Three unloading stations are provided for. Two accommodate rail cars, a third, not shown, unloads tractortrailers. The high degree of automation built into this system reduces labor requirements to one man at the switchboard and, when unloading at Station 2, a man operating a pick-up tool.

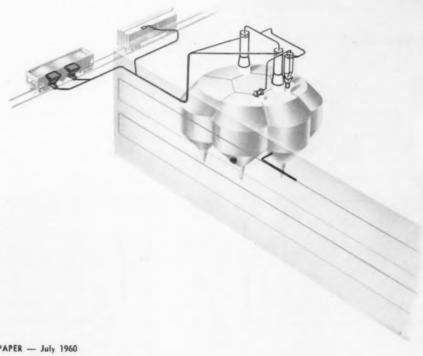
Allen-Sherman-Hoff Pneumatic Materials Handling Systems are in operation throughout the world-we pioneered in this field. You'll find our installations in plants where reliability of performance is of paramount

The system illustrated is a page from our new Pneumatic Materials Handling Bulletin, PM-1. If you are interested in more efficient materials handling you should have a copy. We'll be happy to send you one, along with the name of your local A-S-H Representative-he's a materials handling expert you should get to know. Write, wire or phone . .

THE ALLEN-SHERMAN-HOFF COMPANY, 247 East Lancaster Avenue, Wynnewood, Pa.

Our new Bulletin PM-1 points the way to Pneumatic Materials Handling for your plant and your materials. It's free for the asking.





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SYNTHETIC CONTENT DRYER FELTS

All Scapa Long-Wearing Synthetic-Content Dryer Felts now in production are protected by *Patent Applications* in all papermaking countries of the world, and their manufacture and supply are *exclusive* to the SCAPA ORGANIZATION and its LICENSEES.

* SYNTHETIC-REINFORCED COTTON DRYER FELTS,

with 10/12% synthetic-content

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- ★ DACRON-NYLON DRYER FELTS, 100% synthetic-content

All Scapa synthetic-content dryer felts are electrostatically neutral.

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- Lower Cost Per Ton

* World Patents granted and pending

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Russians Visit Canadian Mills

• Russia's pulp industry has much to learn from Canadian engineering, according to Georgei M. Orlov, vice chairman of the USSR's state planning commission and former minister of forests, who headed a group of 10 Soviet pulp and paper executives and technical men on a tour of Canada in May and early June.

The Russians came, they saw and they marvelled at some of Canada's new mills, especially those on Vancouver Island, and when they visited operations in Quebec and Ontario as well as in B.C. they kept continuously busy taking notes, drawing plans, photographing and asking questions.

The tour was in return for the visit made to Soviet Russia last year by a delegation representing the Canadian industry. It was sponsored by the Canadian Pulp and Paper Association, whose Technical Section was represented by Douglas Jones, executive secretary, and J. M. O'Halloran.

A few Canadians questioned the

A few Canadians questioned the wisdom of giving such privileges to representatives of a nation that promises to be keenly competitive with Canada in the field of pulp and paper exports, but representatives of the Canadian association pointed out that there are no secrets in the industry any more, even on an international scale, and that cooperation in industry is more likely to create a favorable climate for cooperation in politics than a policy of exclusion.

While Robert M. Fowler, president of the Canadian Pulp and Paper Association, declared at the annual meeting in Montreal last January that the full impact of Russian competition might be felt in five or eight years, Mr. Orlov said that, in his opinion, Russian mills would be too busy meeting their own country's requirements to enter the export field on a large scale for many years.

"We supply only 30% of our own needs in pulp and paper," said Mr. Orlov. "But we are making steady gains, and in 20 years we expect to surpass the U.S. in production of pulp, paper and paperboard. One of our big advantages is the extent of our forests. No other country in the world can match it, not even Canada."

But while Mr. Orlov is confident of his own country's potential productiv-

ity, he said that some of the mills he had seen in British Columbia were far more modern and efficient than anything in Russia. The Russians were particularly impressed with the new mills of Crown Zellerbach Canada at Elk Falls, MacMillan, Bloedel & Powell River at Port Alberni, and B.C. Forest Products at Crofton.

Meet with Engineers

Mr. Orlov and his associates were anxious to meet representatives of the engineering firms most active in the pulp-paper field in Canada—Sandwell & Co. and H. A. Simons, Ltd., in Vancouver, Stadler, Hurter & Co., E. & B. Cowan and others in Montreal.

Howard Simons, Paul E. Cooper (Sandwell & Co.) and others conferred with the Russians when they were in Vancouver, but no firm commitments were made.

It was stated that Russia has ordered papermaking machines in the U.S. and five more would be purchased somewhere on this continent in the near future. "The United States trades with Russia, but reluctantly," said Mr. Orlov with a smile.

During their mill visits in Canada, the Russians were keenly interested in instrumentation and technology associated with the utilization of mill residue.

The Russians admitted that, in comparison with Canada's, the Soviet pulp-paper industry is backward, but they said they were determined to do all they could to close the gap by seeking information wherever it was available and, where necessary, hiring skill and experience to perform the specialized jobs for which Russians might not yet be qualified.

Unimpressed in Woods

However, the visitors from the USSR are not as favorably impressed with Canadian logging methods as with Canadian mill operations. When Mr. Orlov headed a mission to Canada in 1956 as minister of forestry, he and his party concentrated on woods operations; they visited no logging camps on the recent tour. Mr. Orlov has a vivid recollection of West Coast logging as he saw it four years ago. He called it "barbarous" because of the apparent waste in the forest, par-



GEORGEI M. ORLOV, chairman of USSR state planning commission, headed group of Russians on tour of Canadian mills.

ticularly the failure to utilize tree tops which in Russia were used in pulp manufacture.

Canadians were quick to point out that it was unfair to compare conditions in the woods between Russia and Canada because of the difference in terrain, type of timber and—most important of all—the difference in labor costs.

"We could well afford to pick up every stick in the forest after logging if we paid the wages they pay in Russia," commented L. L. G. Bentley, vice president, Canadian Forest Products.

Mr. Orlov said that wood utilization was a problem in Russia, too, where most of the production is incomparatively small mills scattered through the forest regions. He added that there were a few integrated woodusing operations in Russia, but not as many as he would like to see.

Members of the Russian delegation were: Georgei M. Orlov, vice chairman of Gosplan, RSFSR (Russian Republic), Minister of SRFSR; Vladimir Likhobabin, Valentin B. Alekhin, Dimitry G. Viatkin, mill managers and directors; Pavel S. Bondarenko, director of the Institute Niibummash; Ivan D. Tsvetkov, chief engineer of Gosplan; Alexander S. Antonov, manager of the pulp and paper branch of the Institute of Automation and Construction of Machine Tools of the Council of Ministers USSR; Alexei V. Vacenko, chief specialist of the State Scientific and Technical Committee of the Council of Ministers; Olegue I. Ponomarev, engineer of Gosplan.

Nearly Everyone's Doing It

More and more U.S. mills are coating, including an estimated 21 in the South; 12 more (including 1 news print mill) are ready to go

By MAURICE R. CASTAGNE Eastern Editor, PULP & PAPER

• If there had been any doubts, and there were none, TAPPI's 11th Coating Conference proves that coating is definitely in the big leagues. Total registration of 956 makes the 1960 conference the largest special TAPPI meeting, second only to National TAPPL

Held at Chicago's Edgewater Beach Hotel, May 23-25, the central location plus the intense interest in coating and favorable business conditions combined to top last year's record registration of 801. Since the first Coating Conference in 1950, this publication estimates that coated paper and paperboard capacity has grown from 2,150,000 tons to about 5,800,-

000 tons in 1960.

Why so much interest? Uppermost in coating leaders' minds are the variations on the blade coaters; the "Great Coating Debate" (we'll come to that later); double coating with one or more blade applications; and wet end efficiency. The Coating Conference is the one meeting where world coating leaders can discuss trends and problems. "It is," says one international visitor, "the only place in the world where you can gather so much information about coating. It is unbelievable how much I have learned about coating at these meetings.

The 1960 Conference, the first of the new decade, will be remembered not so much for the spectacularly new as for the confirmation that coating trends set in the past five years are still continuing. In other words, the trailing blade coater is still hot. According to an estimate by PULP & PAPER, there are between 100 to 120 blade coaters, commercial and experimental, either in operation or on order the world over. The estimate a year ago was 90 units. Five years ago, there were about 2.

The impact of coating upon Southern kraft paper and paperboard has been phenomenal. Each year the number of Southern mills that are coating increases. Last year there were an estimated 15. PULP & PAPER estimates that about 21 Southern mills are now coating. Two mills using trailing blade coaters have just started up. As Eric Jones of Crossett Co's, research department explains it, increased competition has spurred the paperboard industry to diversify and improve its products. Many mills are developing new coating applications to improve protective properties and printing characteristics of folding carton stock. The big problem is that coated bleached board sells for about the same price as uncoated bleached board, so mills are looking for a good print quality with a minimum of coat-

Some newsprint mills have thought of taking the coating plunge. At Chicago, one big newsprint mill, which had been "just browsing" during previous coating conferences, was reportedly ready to buy.

Interest Is World Wide

The Coating Conference continues to attract international visitors. This year's list includes technical coating leaders from Japan, The Netherlands, Scandinavia, West Germany, Italy, England, Scotland, and Australia. And Canada, of course

In meeting circles, the Coating

Conference is considered a fine example of how a meeting should be planned and run. The Coating Committee Council selects officers for each conference. "Their extreme care in selecting members is a major reason for the excellent manner in which the sessions are handled," savs Harold Annis, executive vice president of TAPPI and vice president for research and development, Oxford Paper Co.

The Coating Committee Council includes Chairman Jack E. Wilber, St. Regis Paper Co.; Chester "Chet" G. Landes, consultant; Frank Kaulakis, Consolidated Water Power & Paper Co.; Robert W. Hagemeyer, Wyandotte Chemicals Corp.; and Richard Martinek, Kimberly-Clark Corp. Mr. Hagemeyer was general chairman of the 1960 Conference and Mr. Martinek, program chairman. W. E. "Bill" Welliver, Minerals & Chemicals Corp. of America, was publicity chairman and Charles "Chuck" W. Cairns, Dow Chemical Co., was local arrangements chairman.

"Successful conferences don't just happen," stated Mr. Hagemeyer. "They must be planned." He explained that members of the committee had invested some 3,000 man-hours, worth about \$35,000, to plan the meetings. The mills and suppliers who had about 956 representatives at the meetings, probably invested some \$350,000.

The Great Coating Debate

Perhaps the most hotly debated subject in coating today is which is better, on- or off-machine blade coating. Says Phil Peterson, trailing blade expert for Rice Barton Corp., have about 60 trailing blade installations, about 50% on-machine. You can argue with all honesty for both sides and you can get convincing arguments for both sides, but it is an absolutely moot question. It depends on the individual mill. For some mills, it's clear cut; for others, it's a prob-

lem.
"Until a year or two ago, the trend

had been about 50-50; now onmachine has a slight edge. Until recently the trend had been confined to publication grades favoring on-machine, but in the last few months onmachine board coaters are picking

Says one expert, "This is the touchiest and liveliest subject in the in-dustry today." At the Coating Con-ference, PULP & PAPER asked some coating leaders for their preference. Here is a consensus of what they said.

Generally, there may be one rule applied. If you are planning a new

installation, if your production will be one grade and weight and if your paper machine can run at coating speeds, then on-machine is favored. This is especially true for publication grades. Remember, you can coat consistently with the blade at 2,000 fpm speeds.

The Case For On-Machine

One company's research manager says that, basically, it is a question of machine efficiency. On-machine is far less expensive from standpoint of capital investment and labor costs. Labor is the big thing. They estimate they would have to add 4 to 7 men, depending upon the installation, for offmachine. This involves upwards of \$80,000/year.

He sums up the case for on-machine this way: (1) there is 2% to 3% less shrinkage; (2) less manpower; (3) less capital investment; (4) increased cost of \$5 to \$10/ton for off-machine publication grades (You can't afford this in the publication area, he says); (5) delay from uncoated to coated sheet is 2% to 3% more than on-machine operations.

chine operations. The question of the efficiency of the paper machine is the main criterion, according to many coating experts. If it won't hurt the efficiency of your paper machine, some say, put it on. Frequently stressed is the fact that you've got to be a good papermaker to be a good coater. "Nobody has any business starting a high-speed onmachine coating operation without getting his wet end house in order," states one coating man. "This may sound academic," he says, "but actually this is basic to making good coated paper. Many of the troubles blamed on the blade coater are actually troubles with leads on the paper

machine, draws and tensions."

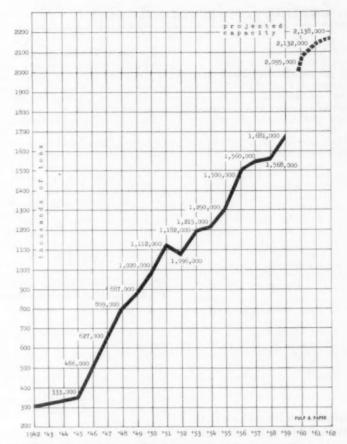
This question of a good base stock is involving the industry in a major re-appraisal of coating techniques. After much frustration with blade coaters, operators are learning that the base sheet is more important than they suspected. More attention, says one expert, must be paid to stock preparation, pulping, for coating onmachine.

One coating expert poses this question, "Coating is certainly not cheaper than pulp, so why do we tailor the coater to the paper machine? Paper machinery manufacturers should work toward adapting the paper machine to the coater rather than the other way around."

Against off-machine coating is that two rewinding operations are involved.

For Off-Machine

Just as vehemently will the offmachine proponents argue. But here's



U.S.A. PRODUCTION OF MACHINE COATED PRINTING PAPERS on an annual basis, 1942-1959. Projected capacity shown by broken line.

what happened with one company. "We liked it off and tried to prove it out economically," PULP & PAPER was told. "We said that with on-machine you are going to have trouble with the base stock. With off-machine you have the opportunity to reject paper that should not have coating put on it. With board the situation might change depending upon how expensive a unit is being put on the machine."

"But we put the coater on the machine. Management said we could talk all we wanted about off-machine coating and talk about the fact that the machine is able to run less time. They said no matter how attractive off-machine looks now, maybe we will be able to lick the on-machine problems or else some of our competition will lick them and we would be at a disadvantage."

A big advantage with off-machine is that the paper machine does not have to be shut down if the coater is giving trouble. With reference to paperboard coating, there isn't a paperboard machine yet, reminds one expert, that will operate higher than 600 fpm on lightweight board. With the blade coater, some say that the higher the coating speed, the less trouble you have. You would have to go off-machine for high speed coating blade advantages.

Operating Variables With A Blade Coater

This was an outstanding paper in the opinion of several coating experts and presented for the first time detailed information on the operations of the trailing blade coater. Until now such experience has been described only in general terms.

W. J. Follette, project leader and R. W. Fowells, asst. chemist, central research dept., Crown Zellerbach Corp., Camas, Wash., described a simple method for calculating blade pressure. For a given operating speed and coating cord formulation, variations in blade pressure will produce predictable changes in coating weight.

... Coating Conference Report

These changes take the form: W. equals B over P to the A power.

At the present level of knowledge, the values of A and B must be determined experimentally. Once established for a system where machine operating speed and color characteristics are held constant, necessary change in blade pressure to get the desired change in coating weight can be readily calculated. But, it is not possible to calculate required blade pressures for a different system without first experimentally establishing val-ues for A and B. W is coating weight; P is applied blade pressure and A, B are constants for the system. A is the rate of change of coating weight with changes in P. B is the amount of coating applied at a blade pressure

Trials were made on a 25-in. experimental coated with two flexible trailing blade coaters. One head had a "puddle" type coater, the other permitted the blade angle to be adjusted. Maximum operating speed was 700 fpm. Additional work was done on a commercial off-machine 70-in. unit with 1500 fpm for maximum speed.

Champflex: A New Blade Coater With Rotating Rod Principle

The first public disclosure of Champion Paper & Fibre Co's Champflex coater was a climax of the Coating Conference. Heart of the unit is the Champflex blade, which is a small diameter rotating doctor bar held in a spring mounting. Body of the blade is a spring steel strip about 3½ in. wide and .025 in. thick. Two thin strips shaped to hold the rotating bar are welded along one edge of the bar.

As explained by Charles G. Whelpton, asst. manager, European & Licensing Div., Champion, the credit for the invention goes to Edgar Warner of Champion's research and development division. The rotating rod is chrome plated for long wear and rotates at 10 to 20 rpm against web travel direction. As the rod turns it is continually wiped clean by the stainless steel strips which form the socket which holds it. Foreign particles do not lodge between blade edge and web, says Mr. Whelpton, but are ejected from the nip and washed away by the fluid coating doctored from the web.

Coat weights vary. One coater can apply from 1 lbs. to 15 lbs./ream (25x 38-500) on uncoated stock. Usual solids have been 50% to 55% and operating speeds from 500 to 1,000 fpm on

paper and 175 to 500 fpm on board. Champion recommends two light-weight coats, says the priming action of the base coat is good. Two coats permit use of different formulas for base and top coats.

The Champflex coater has been licensed in the U.S. and two other countries. Three installations are on printing papers and two on a variety of bleached board grades. A third board installation is scheduled for early 1961. In addition, a conversion roll coater has been equipped with a Champflex blade. Two coater installations are believed to be on the West Coast, one in the Midwest and a fourth in the South. The Southern mill will be on-machine.

Improved Electrostatic Coating Process for Flat Gummed Paper

At the Coating Conference in Cleveland in 1955, Bergstrom Paper Co. and Battelle Memorial Institute disclosed a process for electrostatic coating. Since then the process has been improved and the Brown-Bridge Mills, Inc. at Troy, Ohio, is now using this dry coating process on a 60-in. coater. Water soluble adhesives and flexible binder material are applied in dry powder form.

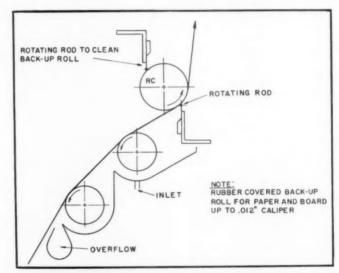
Co-authors of the paper describing the new process were F. W. Holt, vice president and technical director of Brown-Bridge; C. H. "Clem" Lorenz, manager, sales division, Dilts Div., The Black-Clawson Co.; and R. B. Reif, applied physics div., Bat-

Basically the coating composition in powder form is suspended in an air stream, is charged electrically and deposited on the sheet by electrostatic forces. Charging is accomplished with unipolar discharge from a series of wire at a high electrical potential. Charged particles are then driven onto the paper by forces exerted by the electrical fields in the coater. Coating weight is controlled by density of the powder cloud. Web speed is limited by density of the cloud that can be generated, and by the rate at which electrical charge can be drained off the powder layer deposited. The amount of charge on the powder layer limits the amount of coating that can be applied.

The 60-in. plant model coater can apply 15 lb. coatings (25x38-500) at speeds up to 300 fpm. This process, says Mr. Holt, may make it possible to eliminate dangerous or expensive solvents; to handle troublesome materials more easily or in an improved form; to improve quality; or to provide coating with characteristics now available.

Rice Barton Introduces Super Trailing Blade Coater

Rice Barton Corp., pioneers of the trailing blade coater with more than 60 installations, disclosed details of their new super coater which has been completely redesigned. Ruggedness is one feature of the improved design and special emphasis has been placed upon flexibility of adjustment during



NEW BLADE COATER, Champflex, by The Champion Paper & Fibre Co., is improved design over their Champion rod coater. Diagram shows setup for paper coating.

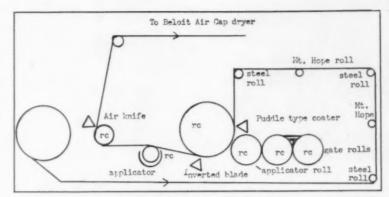
operation. Also included are air loading of the blade for weight control and quick release device for faster blade change. There is a micrometer head adjustment for positioning of the head with relation to the backing roll. Feed and drain outlets are an integral part of the new design. Feed is through the back, coating color drains through the bottom. Felt dikes are used and air dikes are in the development stage.

Eight of the new super coaters have been installed. One laboratory coater operated smoothly at 2,000 fpm within one day after startup, reports Rice Barton.

Roll Transfer Inverted Blade Coater Unveiled By Beloit

After the Coating Conference, Beloit Iron Works invited conferees to see their hitherto secret experimental (about 30-in. wide) coater at their research laboratory. During the demonstration, coating was applied to a 36 lb. base sheet at speed ranging from 1500 to 2500 fpm.

Coating formulation consisted of 100 parts clay, 16 parts starch, ½ part soap. About 4 to 6 lbs./ream at 60% solids were applied. At the higher coating speed of 2500 fpm, about 4 lbs/ream were applied. After examining samples of the stock coated at



ROLL TRANSFER INVERTED BLADE COATER by Beloit: Coating is distributed between gate rolls and is picked up by applicator roll which applies coating to sheet. Inverted blade removes excess coating.

2500 fpm, one mill man remarked that the coating appeared to be good. Arrangement of the coater offers opportunity for changing coat weights by the operator without having to resort to formulation changes.

Also in operation was Beloit's high velocity impingement air cap dryer. Its design features: (1) sheet is exposed to a smooth and continuous perforated plate; (2) 1-in. clearance between cap and sheet allows ease in sheet handling; (3) perforated plate design optimized to give maximum heat transfer for a given air hp input;

(4) no small slots or clearances to cause clogging from fiber dust, paper or coating; (5) steam, oil and gas may be used for heating air.

The Flexiblade

The Black-Clawson Co's. Flexiblades are now operating at high solids of 65% to 66%, reports a company official, who also predicts that this range will soon be 70% to 80%. This will enable the coater, he says, to operate at higher speeds and to reduce dryer needs.

Market Pulp Mill for British Guiana

Dissolving and paper pulps will be made by 500 tpd kraft process mill near Georgetown

Some 500,000 acres of land formerly prized for their columbium metal content will yield, instead, timber for an integrated pulp and lumber operation. According to M. W. Ditto, president, Columbium Corp., the \$35,000,000 mill will be operated by a wholly-owned subsidiary, British Guiana Pulp & Paper Co., Ltd.

Financed principally by Italian interests, a major part of the production of the 500 tpd mill has been sold for a 10-year period. Operations of the pulp mill are scheduled to start up about mid-1962. Advantages for building in British Guiana, explains Mr. Ditto, are a five-year tax-free incentive granted by the British Guiana government, favorable labor costs, low power and less capital cost per ton of capacity.

The mill will rise on a 2,000 acre site on the Essequebo River, 45 miles by air from Georgetown and 85 miles by river. It will be called Wolfson City after D. S. Wolfson, secretary and treasurer of Columbium, who initiated the project

tiated the project.

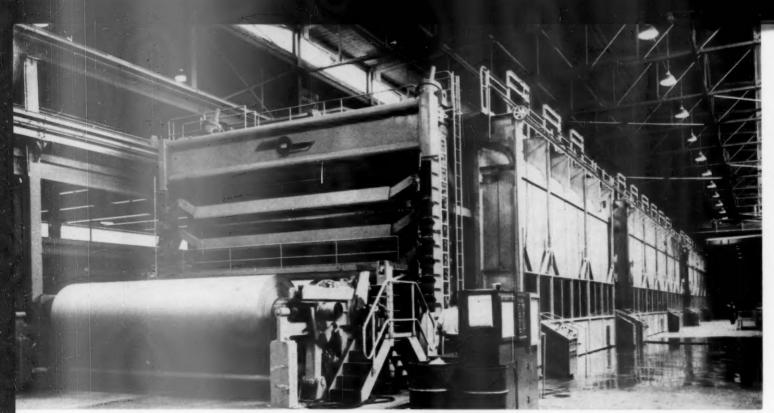
In 1958 about 125,000 acres were timber cruised to estimate the amount available for lumber. Yield then was estimated as 1,034-cu. ft. yield/acre of trees above 16-in. dia. Because of the ability to use smaller trees for pulp, this estimate has been revised upwards 10% to 1,200 cu. ft. yield/acre. About 126 species of hardwoods grow in this area, with the famous wallaba tree comprising 27% of total yield.

A standard gauge railroad line will extend 45 miles from Wolfson City to

about 15 miles inside the logging areas. Because of the great size of the trees, huge logging equipment will be used.

Tests conducted by Solvay Process Div. of Allied Chemical indicate a cooking time of 2% hours. Six batch digesters will be used, 65-ft. high by 16-ft. dia. Kraft dissolving pulp will be bleached in five stages including one chlorine dioxide stage. Sulfur will come from Mexico, salt for standard electrolytic production of chlorine and caustic will come from Santo Domingo. A nearby shell beach in British Guiana will supply lime. Here there is a large accumulation of sea shells, 5 miles long, ¼ mile wide and at least 40 ft. deep.

Mining operations will follow the logging operations. Columbium has 119,000 acres of mineral rights. The British Guiana government will specify what trees in the cutting areas will be left for natural reforestation.



DESIGNED FOR SPEEDS UP TO 3,000 fpm., Union Bag-Camp's new No. 7 Beloit machine has 236 inch wire, was major part of expansion. It upped mill production to 2,560 tons in one day, pushed mill average to 2,260 tons in a month.

Biggest Gets Bigger!

Union Bag-Camp puts its seventh machine to work at Savannah; backs it up with electronic brains and scientific research

By WILLIAM F. DIEHL, Jr.
Southern Editor, PULP & PAPER

Savannah, Ga.

Although it is somewhat presumptuous to refer to any paper mill as "the largest" or the "biggest producer" there can be little argument that Union Bag-Camp's aweing operation here on the Georgia coast is the biggest paper mill in the world.

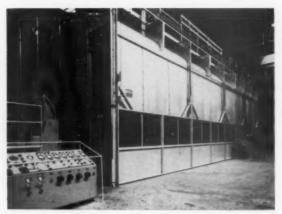
Any doubts that may have existed in the past have probably been dispelled with the addition of Number Seven paper machine. This 3000 fpm linerboard machine caps a \$35 to \$40 million expansion program conceived in 1956. It was designed to bring daily production in the mill up to 2400 tons, a figure which has already been exceeded on a daily basis.

One of the South's oldest mills, Union Bag-Camp began operations in 1936 and its remarkable growth pattern has been evident from the start: By 1937 the second machine was underway and Number Three was under construction the following year. By 1940 daily production was up to 600 tons. The mill's fourth machine started up in 1942 boosting tonnage to 800 tons a day. Number Five in 1947 pushed it to 1050 tons and the year after that Union Bag added its bag plant. An improvement program in 1949 pushed tonnage up to the 1200 ton mark. Early in 1950, Union Bag embarked on its "alphabet" expansion series. Program "A" included Number Six machine and the company's entry into the NSSC corrugating field plus increase to 1800 tons capacity. "B" was a modernization plan which got daily production to the 2000 ton mark.

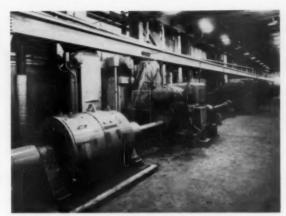
Under the just completed "C" program, Union Bag-Camp has added its seventh machine, modernized and enlarged the woodyard, pulp, paper mill and materials handling department. An important part of this program was the increase in hardwood pulping and handling facilities, a move in keeping with current trends.

Not overly modest, Union Bag feels its new paper machine is the best in existence on linerboard. As modern as any machine running, it has several interesting features including a "radically different" press section. Electronics, too, played a big role in the field of materials handling where a unique "kittycar" delivers finished rolls automatically. Its progressive spirit is further evidenced in the operating experiment it made on digester corrosion. Its findings were made available to the entire industry when the experiment was completed.

the experiment was completed.
With the "C" program under its belt, Union Bag-Camp now looks toward future expansions as minor modernization-type plans, thinks it has now reached a satisfactory production level. Last year, for instance, it produced 704,560 tons of product; 200,000 tons of bags (35 million every 24 hours); spent \$28.5 million in wages, another \$17 million for ingoing and outgoing freight. Its merger with Camp Manufacturing Co. in Franklin, Va., also gives it a neat diversification set-up. Under the arrangement the Virginia mill will intensify its bleaching and coating operations. The Savannah mill will remain a mass production center.



PROVIDING UNUSUALLY QUIET and cool machine room, stainless steel totally enclosed hood was supplied by J. O. Ross. Windows enable observation of machine without lifting hood. Ross also supplied bottom felt system, Drypector units, two air makeup units.



EASILY ACCESSIBLE DRIVE has a 3,000 hp. Westing-house steam turbine transmitting power through continuous lineshaft to Beloit differential gear units. Lineshaft also drives two generators which provide current for first press and 21 other driven rolls on machine, and motors.

3000 fpm machine to up hardwood use

The 3000 fpm Beloit machine features an airloaded headbox with cross flow distributor, adjustable slice, foam killer showers, and rectifier rolls with variable speed drives. Its Fourdrinier is 236 in. wide, 140 ft. long, has 30 table rolls, seven suction boxes, a 36 in. breast roll and 44 in. suction couch.

Its unique "upside down" press has an automatic suction pickup, inverse first and second suction presses, a conventional third suction press and a suction wringer. Furthermore the machine has what is probably the largest couch pit in existence; stretching from the suction pickup all the way to the third press section. This pit can accept full machine production continuously.

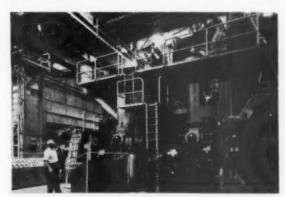
The pickup felt runs through the first and second press and the wringer press with a separate felt in the third press. The suction rolls in this press section are in the top position in the first and second press. If anything happens after the second press the machine production goes into the couch until trouble is repaired.

The special Ross hood was built in three sections, leaving openings for the breaker stack and size press. The combination breaker stack and striping press is between the second and third dryer sections. It is three rolls arranged so they can be used either as a breaker or striping press. The two-roll horizontal type size press is between the fourth and fifth dryer section. The machine has an

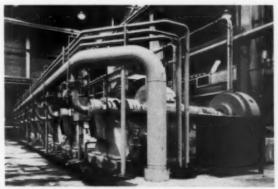
eight roll calender, open-sided, with a 34 in. king roll.

The 48 in. reel is built to accept paper rolls up to 96 in. in dia. The heavy duty winder will go to 7200 fpm, is equipped with shear type slitter, roll ejector, shaft puller and shaft transfer. Broke at dry end of machine is handled on a full machine width belt conveyor extending from size press past the reel. It discharges into E. D. Jones Pulpmaster.

Both hardwood and pine stock are used on Number Seven machine, in a ratio of about four-to-one. Pine is pumped directly from the decker chest in the screen room to the raw pine chest at number seven machine. From these it goes to seven Sutherland refiners driven by 450 hp. motors, is discharged into the pine machine chest, and then goes through

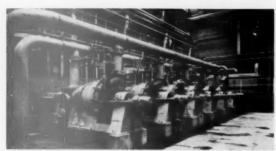


GIGANTIC PRESS SECTION has automatic suction pickup and inverse first and second suction presses. Third press and suction wringer press are conventional. The 180 ft. pickup felt is common to first and second press, has Vickery conditioner.



INITIAL REFINING OF HARDWOODS and pine pulps is carried out in these Sutherland refiners, driven by 450 hp. motors and located ahead of the machine on the machine floor. After refining, stock is then pumped into a machine storage chest.

... Union Bag-Camp Expansion



FROM MACHINE CHEST, stock is treated in one of five Miami No. 5 Black-Clawson jordans, also located on main floor.



STOCK IS GIVEN cleaning in 31 primary, six secondary, two tertiary Nichols Freeman Vorject cleaners.

five No. 5 Miami Black-Clawson jordans. Refined hardwood stock is pumped through one Miami No. 5 before going to the machine. Both pine and hardwood stock is then circulated through a battery of Nichols Engineering & Research Corp. Vorject cleaners. The cleaned pulp is delivered to the machine via a 33,000 gpm. Ingersoll-Rand fan pump. Vacuum pumps on the machine are Nash Hytor 5308A arranged in two banks of four each, with each bank driven

by a 1350 hp, G.E. motor. Repulped broke is pumped back over an 8 ft. by 16 ft. Impco vacuum saveall and returned to the raw pine chest.

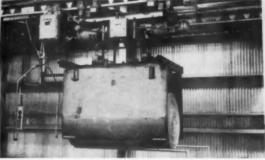
Besides these new additions, changes have also been made in the existing pulp mill to handle more hardwood pulp. In the hardwood kraft system stock is pumped from a decker chest to six Black-Clawson No. 5 Miami jordans and goes to a refined stock chest. From this chest hardwood stock goes to one jordan

ahead of each paper machine for secondary refining and is then mixed with pine prior to the fan pump. Stock to each of the machines is metered by Fischer & Porter magnetic flowmeters

Other pulp mill improvements included two lines of Swenson Evaporator Co. 9 ft. by 16 ft. washers preceded by Impoo A25 screens or knotters, high density stock tanks, five filtrate storage tanks, a soap tank, a vent tank and two foam towers. Three



 CARRIER UNIT waits behind machine while paper rolls are banded by Signode machine and weighed. Roll is kicked from scales to trough at left which activates awaiting cradle.



2. ROLL IS GIVEN number according to weight, destination, Carrier electronically delivers roll to its destination. Electric eyes prevent units from emptying on loaded conveyors.

New roll handling concept

There has been a great deal of talk and speculation in the industry concerning electronic roll handling systems. Union Bag-Camp has come up with one of the first successful automatic operations. This unique materials handling system is tied to all seven machines and relies on limit switches, sense control points, electric eyes and other electronic devices.

Union Bag's engineers worked closely with those of the Lauden Co. for nearly a year-and-a-half developing this 1600 ft. system. The prob-

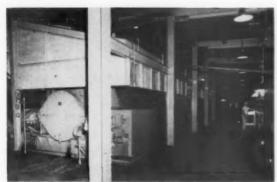
lem seemed insurmountable at first since all seven machines were emptying into a rather small storage area.

The system uses 18 self-contained carts, each with its own brain. If a unit breaks down it can easily be pulled out of the system at several points along the way. The carriers seek out a place where they are needed then park until they are loaded with a paper roll. The rolls are automatically delivered to the unit and an operator sets a selector switch and away the carrier goes to

deliver the paper in the right place. An elaborate passing station with five parallel monorails provides a place for passing or waiting.

Rolls are deposited in a small trough and either roller flight conveyors or inclined ramps then permit them to roll into a loading dock in the warehouse. Overhead cranes then deposit the rolls in pre-designated areas.

Differences in elevations of both pick-up and delivery are taken care of automatically by a lift section in the main monorail line or by lowering the controls at the drop points.



COSTLY "C" PROGRAM included additions in pulp mill such as two lines of five-stage Swenson washers.



NEWEST POWER addition is 25,600 KVA Westinghouse turbine generator, a 3,600 rpm. non-condensing machine.

valveless deckers were installed in the screen room to serve as an additional were added.

In the recovery area, there is a new Smith 10 ft. 6 in. by 265 ft. lime kiln with 10 ft. 6 in. Peabody scrubber and two 40-in. by 60 in. Bird centrifugal filters. An additional Dorr-Oliver slaker, an 18 ft. causticizer, a 40 ft. Dorr-Oliver white liquor clarifier and a 30 ft, white liquor storage tank were added in the causticizing area.

A septuple Swenson evaporator with a feed rate of 800,000 lbs./hr. with a 583,000 lbs./hr. evaporation rate, stainless steel tubes in the first two heating elements and Worthington pumps throughout was added. Combustion Engineering also installed a new recovery unit capable of handling 1,610,000 lbs. of dry solids a day and generating 218,500 lbs. of steam/hr. at 425 psi and 750° F. It is equipped with Diamond soot blowers and two D, J. Murray evapo-

rators and works in conjunction with a Research-Cottrell electrostatic precipitator rated at 200,000 cfm.

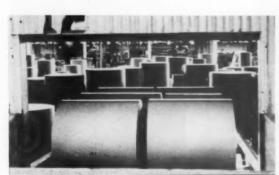
Increased power demands were met with addition of a Babcock & Wilcox 550,000 lb./hr, power boiler and a hydrogen cooled Westinghouse turbo-generator rated at 25,600 KVA at 30 psig hydrogen pressure. The turbine is a non-condensing back pressure machine with inlet steam conditions of 1200 psi, 950° TTF exhausting at 150 psi.



3. COMPLEX TURNAROUND STATION has five monorails and permits traffic from seven machines to pass each other or be unloaded for delivery to shipping station below.



4. WHILE EMPTY CARRIERS seek new loads, one roll is delivered to warehouse station, second from left. Frame in front of unit automatically stops carrier when it strikes an object.



5. ROLL IS DELIVERED into trough at warehouse and rolls down inclined ramp, through opening into loading dock on other side of warehouse wall.



 LAST LEG of the journey requires manpower. Rolls are stored by designation in large warehouse. Storing on end permits easy access.

... Union Bag-Camp Expansion



LONGEST LINE of digesters in the industry can be partially seen in this line of 47 vessels. Newest digesters are same size as older ones to permit use of same loading equipment. All were part of experimental work on corrosion effects on different vessels.



ON MOTOR SCOOTER, chip operator scoots from one end of long line to the other. A traveling belt delivers chips.

How Union Bag used digesters in corrosion studies

It is an impressive sight to look down the long row of 47 digesters which Union Bag-Camp has in line. What is even more impressive is the fact that for several years Union Bag-Camp carried out an experiment to determine which type of digester lining was the least susceptible to corrosion. The facts from this operating experiment are now available to the industry.

Corrosion Experience Unusual

Union Bag-Camp's experience in corrosion is unusual for two reasons: first, it relates to an unusually large number of vessels (sixty-one in all) and second, it reflects comparable performance of different materials under extremely similar exposure. The data compiled by Union Bag-Camp covers the entire life span of 23 digesters that have been removed from service and varying portions of life of 38 others.

The original 13 digesters installed at the mill in 1936 were of ASME S-1 firebox steel. During the 13 to 15 years that these digesters were in service, seven other digesters were installed. Four were ASTM A-70 steel and three were A-285 Grade C steel. By 1950, when some of the original digesters were replaced it was quite evident that the newer A-70 and A-285 vessels were corroding at a much more rapid rate than the original units made of S-1 steel. As a result, Union Bag embarked on its experiment. To

study corrosion in all forms the following digesters were installed over a period of time.

Three digesters of ASTM A-212 steel; one of ASTM A-212 steel lined with three inch carbon brick; one of 316 Columbium stabilized stainless clad over A-212 backing steel; five of Inconel clad over A-212 backing; four of rimmed A-285 steel; three of special rimmed A-285 steel (Oxyrim); later replacements and expansions led to installation of other A-285 digesters and one group of eight A-285 steel with four in. carbon-brick lining.

All but five of these vessels were used in the production of kraft. The other five were used 85% of the time on NSSC, the rest of the time on kraft.

Some Conclusions Made

The original 13 digesters made of $1\frac{1}{16}$ in. ASME S-1 carbon steel had a useful life span of 13 to 15 years. Then had an average life span corrosion rate in the critical areas of 35 mils. The life span critical area corrosion rate of a group of seven A-70 and A-285 vessels installed in the 1942 to 1948 period was twice that—75 mils per year. Conclusion at the time; Corrosion resistance of postwar steels was inferior to that of pre-war steels.

The current average corrosion rate of carbon steel digesters in the mill is about 20 mils per year. But the average corrosion rate in the critical areas is about 80 mils. The pattern of corrosion at Union Bag-Camp is fairly uni-

form around the circumference of the vessels. It varies in the vertical direction, however, from a minor rate in the head to maximum in the middle shell. Union Bag believes this preferential attacks results from hot-plate boiling which takes place during liquor-filling operations. No method of eliminating this problem has yet been found.

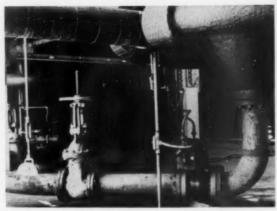
Of the alloy clad digesters, five



INSIDE DIGESTER, engineer H. B. Harris, Jr., inspects area being studied for corrosion. He prepared corrosion report with group leader L. H. Park.



RESULTS SHOWED Union Baggers that A-285 steel is best steel now available for sulfate cooking. These new digesters are A-285 steel and are 2700 cft., small but the size existing digester chip bin will accommodate.



SPECIAL BLOW VALVES on new digesters were supplied by Jamesbury Brothers, operate automatically on chip demand. Fabrivalves are also used for capping. Remote controlled, operator controls vessels.

were one in. thick 20% Inconel clad and one was one in. 20% type 316 Columbium Stabilized stainless steel. Only three of the five Inconel digesters to date have exhibited any detectable corrosion rate. The corrosion rate varies from zero to six mils per year. The corrosion rate of the stainless steel clad vessels is nine mils per year.

Experiences in Overlays

The digester report was not too encouraging on overlays. One of the mill's earliest attempts to control corrosion was application of type 310 ss. welded overlay. The philosophy was to extend life of the digester by using stainless over those areas which were

corroding rapidly. Some success was experienced but once the overlay was applied each subsequent inspection proved necessity for extending the overlay. In one case, 128 feet of 310 ss. overlay was installed in an ASTM A-70 vessel in October 1953. It was extended to a total of five times that total area before the digester's removal in 1957. Rapid attack in the form of undercutting of the plain carbon steel at the edge of the overlay was experienced in every instance.

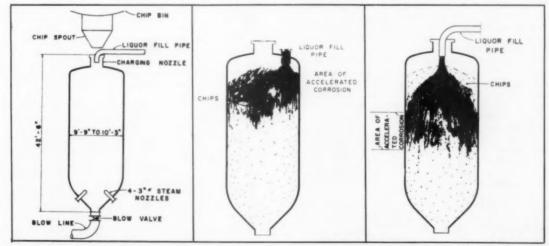
As a result of these tests, Union Bag's engineering staff have made the following final conclusions:

 ASTM A-285 firebox steel is the best steel now available for kraft digester construction. The corrosion resistance of rimmed types does not appear to be superior to semi-kilned types.

Inconel and Type 316 stainless steel are apparently not attacked by kraft liquor. They are, however, slightly attacked by the vapors driven off during the cooking cycle.

3. Carbon brick is completely immune to attack by both kraft and NSSC liquors. Mortar joints, however, are subject to attack. They must be inspected and repaired at frequent intervals to prevent damage to the shell.

4. Small areas of stainless steel weld overlay accelerate the corrosion of plain carbon steel in areas immediately adjacent, requiring continued extension of the overlay.



HOW UNION BAG CHARGES its digesters can be seen in these illustrations. Left is cross-section of typical mill digester. Center is old method of charging the vessels. Right, new method, where pipe squirts liquor in through cap rather than at side. Although an improvement, Union Bag admits it still has a problem due to charging digesters.

Research and Development Growth

VS.

Other Growth Rates

100 =	= Index	x 1945		
1949	1953	1959		
. 100	158	271		
. 100	177	399		
. 100	162	390		
.100	159	387		
	1949 100 100 .100 .100	100 = Index 1949 1953 100 172 100 158 100 177 100 162 100 159		

*Total for government, industry, colleges and universities and non-profit institutions—source, National Science Foundation

**Industry segment of survey by National Science Foundation

Average Research-Development Expenditure in 1959 of 30 Paper Companies Surveyed

Larger size companies .					. \$2,	106,000
Medium size companies						378,200
Smaller size companies						187,924

Survey of 30 U.S. Paper Companies Shows Increases in Research Staff

Size of Companies Median Total Research and
Development Staff per Company
1949 1953 1959

Larger										.64	85	175
Medium										.17	30	37
Smaller										. 5	6	22

SHARP INCREASE IN R & D ACTIVITY is shown in this survey made by Institute of Paper Chemistry. (Details of study are presented on page 66.)

More Spent in Research

Survey shows 30 pulp and paper firms increased outlay by four times in decade. About 230 top executives hear Institute reports

By ALBERT W. WILSON Editor, PULP & PAPER

-Appleton, Wis.

 Once each year the American pulp and paper industry takes stock of its intellectual assets and needs.

The occasion is the Annual Executives Conference, held here in mid-May for the 24th time, in the 31st year of The Institute of Paper Chemistry.

There are other places and other times for this industry to face up to its financial, sales, governmental and public problems. But in this "paper city" about 230 executives from coast to coast, about half of them presidents and senior vice presidents, and the other half top research and development executives, gathered at the Institute above the Fox River to appraise the industry's scientific strength.

1. Dr. John G. Strange, making his fifth annual presidential report, stressed the need for "intellectual readiness" for more difficult industry problems ahead. He broadly reviewed how the industry is spending \$2,100,000 annually at the Institute. He emphasized the need of special funds for "unusual scholarship aid."

for "unusual scholarship aid."

2. Dr. Roy P. Whitney, vice president and dean, traced the records of Institute students, where they came from, where they went, and the many high ranking industry positions they have taken over. About half of the ph.d.'s in this industry come from Appleton's graduate school.

3. The Institute economist, Canadian-born Dr. A. Neil McLeod, reported on results of a survey showing pulp and paper companies are investing much more money in research than just a few years ago. Their increase is 40% greater than for other industries.

4. The evolution of a group research project at the Institute, where a group of companies join as sponsors, was described by staff members with Dr. Johannes A. Van den Akker, physics group chief, as the panel's "anchor man." He summed up the significance of the projects in the Institute program and to industry progress.

5. Dr. E. F. Thode, administrator of the engineering and technology section, and a student panel, described the benefits of the grouped student or "team" research—"learning through doing."

6. A panel led by John W. Swanson, chief of the physical chemistry section, revealed how much more expensive is research equipment today. It calls for new techniques and equipment—the ultracentrifuge, the electrophoresis apparatus, high speed motion pictures, x-ray diffraction, electron microscopy and light scattering.

7. A student panel presented doctoral research reports -how they tackled their thesis topics.

8. Dr. Arthur Larson, an Eisenhower consultant and director of the World Rule of Law Center, Duke University, was dinner speaker at the North Shore Country Club, where the attendance was biggest, drawing many more executives from Fox River valley mills besides those attending the Institute sessions. He advocated a more positive approach by the U.S. in its rivalry with Communism for support of undeveloped countries.

"War of Obsolescence" – Dr. Strange... Industry's Increasing Use of the Institute

Current Institute expenditures run about \$2,100,000 annually, primarily paid by membership dues, cooperative research and scholarship contributions, Dr. Strange told the executives at the closing session.

Income from membership has grown steadily, but the rate of growth has been adversely affected by mergers in which 39 former members were absorbed by others.

The Institute has effected its first general increase in dues in 31 years, in order to pay for enlarged educational activities. Dues rates and maximum contracts were increased 25%, effective as existing contracts expire, thus requiring 2½ years to become fully effective.

"In view of what has happened to the dollar, perhaps our record is not too bad," said Dr. Strange.

In the past year, about \$185,000 has been awarded in scholarships to regular students. Scholarship outlays have increased five times in 10 years and are 70% more than just three years ago. Dr. Strange called for "unusual scholarship support."

The Institute tries to achieve a balance, he said, in its attention to experiences, accomplishments and problems of the past, present and future.

Review of Activities and Records

Thirteen doctoral and 20 masters' degrees were awarded last June—both new records. The 1959-60 year began with 73 students, and 27 have passed to doctoral candidacy. Next September's class will be about the same, but with a higher percentage from Southern schools.

In the post-war era, IPC has ranked in the upper half of 104 universities granting ph.d. degrees in chemistry and chemical engineering. "If one looks at only the last two or three years, I am fairly certain our increased productivity would place us at least in the upper third," he added.

The ninth married students dormitory has been filled (four families) and a tenth unit is needed.

There have been "striking changes in curriculum in ten years—mostly in physical chemistry, biochemistry, chemical engineering and pulp-paper technology. The Institute is heavier in mathematics and biology."

As for new tools, he cited use of the ultracentrifuge in a study of molecular constitution of lignin precursors and a computer station "busy 12 to 14 hours a day."

Special Courses Set Records

The fiber microscopy "continuing education" special course open to mill staffs set a record of 30 in attendance. The fifth industry seminar, which started June 15, was oversubscribed by key mill personnel seeking to attend. Two Institute-sponsored programs for college science teachers were successful and this summer a research participation program is planned for college teachers of organic chemistry.

The Institute is making good headway, said Dr. Strange, in creating a "more effective relationship" with the

Nearly \$12% billion is being spent annually in the U.S. on research and development, two-thirds of funds coming from government, but more than 70% of the work in industry laboratories. One reason—"research has become a central feature of our national arsenal."

"War of Obsolescence"

The struggle between the western world and Communism, said Dr. Strange, seems to be "the War of Obsolescence, with each side hoping that the attrition will be so great that the other will finally yield."

While paper industry research has kept pace with general industry average, the paper industry pays almost its full bill, while industry in general receives half its funds from the government. The paper industry has accelerated its research 40% faster than the remainder of the industry in the past decade, he added, citing Dr. McLeod's figures. The number of personnel, facilities and background work in research in pulp and paper have increased "dramatically."

This means this industry will make even greater use of the Institute, he concluded, and the Institute must be prepared.

In the Institute's year-old "Pioneering Research Program" (fundamental inquiries in sciences which may have ultimate bearing on this industry's welfare), 24 companies have signed 5-war underwriting contracts. More will be welcomed.

Last May there were 109 cooperative projects in progress. Of these, 61 have been completed, 64 new ones initiated. Now there are 122 such active projects and 32 more in planning stage. Half of these are group projects and in several there have been "significant breakthroughs"



STRANGE

Staff Events and Activities

Dr. Strange paid a warm tribute to the late Edwin W. Schoenberger, who has now been succeeded as dean of students by George Jernegan, formerly director of continuing education. The speaker also praised Dr. Louis E. Wise, international wood chemistry authority, for being the fifth staff member to win the annual TAPPI Gold Medal.

In the past year, staff and students have published 84 scientific papers and staff members have participated in 38 conferences held by other institutions or societies. The Institute is presently producing five technical books.

"In the past year, we have received 5,167 visitors, including people from 17 different countries," said Dr. Strange.

Institute Members Make Well Over 80% of Total U.S. Pulp and Paper

The "owners" of The Institute of Paper Chemistry, this industry's only graduate school and its own research center, are 119 pulp and paper companies.

They make "considerably better" than 80% of the U.S. production of pulp, paper and paperboard.

The "urge to merge" in the U.S.A. reduced the number of dues-paying sponsors of the Institute by 39-that number of former separate member companies have been absorbed in

Eight new members joined in the past year:

St. Croix Paper Co.
Abitibi Pulp & Paper Ltd. (now has mill in Michigan).

Allied Paper Mills Co.

Western Kraft Pulp & Paper Co. Minnesota Mining & Manufacturing Co.

Dow Chemical Co. Newton Falls Paper Co. Fitchburg Paper Co.

30 Firms Do Most of Pulp-Paper Research; Rapid Increase Dr. McLeod Finds

The survey of research and development activity within the paper industry, conducted by Dr. McLeod, economist, indicate that the 30 firms which replied to his questions spent about 52% of the total outlay for the industry in these fields.

These companies boosted their R and D expenditure between 1949 and 1959 by four times—much faster than their increase in sales. Their research programs developed faster than that of other industries, Dr. McLeod demonstrated.

Thirty-eight companies were asked to participate in the survey, 85% agreed to do so. 80% responded adequately and these are the 30 companies. Their R and D bill was \$331/3 million.

"I must warn you that this is a conservative figure because we excluded quality control and wherever possible, mill trial expense, etc. I must warn further that this study is *not* typical of the research of the paper industry. But it is typical of that segment most active in research."

The survey covered the years 1949, 1953, and 1959. The year 1953 was selected to coincide with a National Science Foundation series of data.

Fast Increase in Expense

From 1949 through 1959, the R and D expenditures of the 30 firms went from an index of 100 to 399. This increase is much faster than that of sales in these companies or of the sales of the entire industry.

"Now remember that we are an industry that is near the bottom of most lists in the measure of research as a percent of sales," said Dr. McLeod. "Our R and D effort has grown faster than the R and D effort of the country as a whole and faster than the industry segment of the nation. Remember, too, that the U.S. figures are all inclusive (everything including the kitchen sink) while ours are restrictive."

The average R and D expenditure in 1959 for each larger company (\$100,000,000,000 sales or more) was over \$2 million. The medium group (\$50-to \$100,000,000 sales) with \$378 thousand per company was twice the expenditure level of the smaller companies (below \$50,000,000 sales).

On an index basis the smaller companies have increased their spending four fold over the 1949 level, the larger companies are not far behind. The medium group, after a spurt to 1953, are approaching a three-fold increase.

Percent of Sales

Percent of sales increased from .44% in 1949 to .65% in 1959 for the entire 30 companies (see chart). Even the larger companies are spending less than 1%. "It has become a mark of corporate virtue to have R and D as a percent of sales high and rising," said Dr. McLeod. "Isn't this a strange concept? Isn't profit the only item on the operating statement that we want to see increasing as a percent of sales? You do not appraise sales effectiveness by the cost of sales but rather by sales results. It appears that R and D as a percent of sales is merely a convenient calculation with very little meaning. If there is even a limited validity for its use within our industry. there is absolutely no validity for such a comparison among industries because different industries have different research requirements as indeed do different segments within them. As indeed do different product lines within the product-mix of a single company.

Investment in Space and Equipment

In area devoted to R and D, the larger companies have ten times the square footage of the smaller companies. The investment in space about equals the investment in equipment in the medium and smaller groups. But in the larger companies, the investment in equipment of over \$1 million exceeds considerably the value of

Research-Development Expenditure of 30 Paper Companies Surveyed

(Growth rate on	1949	index i	basis)
Size of Companies	1949	1953	1959
Larger	100	176	422
Medium	100	196	290
Smaller	100	150	380

Research-Development Percent of Sales of 30 Paper Companies Surveyed

Size of Companies	1949	1953	1959
Larger	.55%	.60%	.89%
Medium	.31	.46	.51
Smaller	.33	.48	.59
Average	.44	.48	.65



McLEOD

space. The book value of space is about \$10 per sq. ft. in the larger and medium companies compared to \$20 per sq. ft. in the smaller companies. Greater efficiency is achieved in the use of space and equipment facilities as the size of company increases.

Investment in Personnel

"The fact that R and D is expensive can be seen in the rising costs per R and D employe," he said.

Currently even the smaller companies are approaching \$10,000 per employe and the larger companies are over \$12,000. The magnitude of these costs are especially apparent when they are put on the basis of per professional employee.

"If you are yearly spending from \$14,000 to \$24,000 per professional man in the department, that man must bring you the finest education that can be applied to the task at hand." he said.

He reported that an increasing amount of the work is being done by outside agencies, under contract. It has almost doubled during the period and in 1959 7% of R and D was contracted outside.

Basic Research

All three size classifications are doing about the same percentage of basic research (their own definition). The larger companies have not changed much over the period but the medium and smaller companies that were doing virtually nothing basic in 1949 are now doing proportionally as much as the larger companies.

Whereas 14 companies considered that they did no basic research in 1949, now only 4 so believe. At the other end of the spectrum, only 6 companies did more than 5% basic in 1949 and now 14 have moved above the magic five.

"Some indication of the foresight involved in research undertakings may be gleaned from the fact that 20% of the companies project their R and D budget 5 years ahead," said Dr. Mc-Leod.

The utilization of professional staff on routine trouble shooting work ran between 10 and 20%. The maximums reported in each size group ran from 25% to 60%. More research talent is available in most companies if they want to use it.

The libraries of the larger companies were 2½ to 3 times the size of those of the medium and smaller companies. The increase has not been great when viewed on a per profes-

sional worker basis, he said.

"In research spending planned to 1963, a McGraw-Hill survey finds that paper and allied products leads all industry in the percentage increase; 51% against 18% for all manufacturing.

Dean Whitney Traces Careers of Institute Grads-Many Rise to High Management

"Our most vital and enduring contribution to the pulp and paper industry rests in the young men who receive their vital education here and then go to join you in the industry," said Dean Whitney, in making his report.

The three main concepts in objectives of the Institute, he said, are 1) the graduate school, 2) "our devotion to science and technology as contrasted with several other possible major fields," and 3) "the unusual breadth of interest and activity ex-

pected of our graduates."

"We believe that men with a broad viewpoint, who understand the interrelationships among scientific fields and can range across the boundaries of disciplines in their pursuit of knowledge and insight, will be among the key people in guiding this industry to new vistas and new accomplishments. In short, we strive to develop the scientific generalist, well versed in several disciplines within the physical sciences, but specialist in none."

Referring to Dr. McLeod's survey on the size of research and development staffs in 30 paper companies, Dean Whitney showed a chart revealing the median size of the research and development staffs and their rapid growth in the past ten years. These figures represent the total staff, both professional and non-professional.

Number of Ph.D.'s

"It is interesting to note that just about half of the Ph.d.'s represented in this chart earned their degrees at The Institute of Paper Chemistry,"

Geographic Sources of Institute Students

A	ll Former	In C	lass Entering
	Students	School	Sept. 1960
	%	%	%
Northeast	28	32	33
South	14	10	33
Midwest	41	38	17
Plains	4		11
Far Wes	t 10	17	6
Foreign	3	3	



WHITNEY

said Dr. Whitney. "We have chosen to draw our students primarily from men with undergraduate backgrounds in either chemistry or chemical engineering. We have tried to maintain about an equal distribution. The last several classes are showing a tendency toward more chemical engineers.

"We have tried to design our own academic program to build on undergraduate backgrounds, to broaden our students' understanding in mathematics, physics, and biology, and to knit these elements together using the science and the technology of pulping and papermaking as the unifying thread. Our curriculum of today bears little relationship to that of 30 years ago, even though our broad objectives remain unchanged. Undergraduate chemistry and chemical engineering curricula have undergone major changes during this time, as has the technology of the pulp and paper industry.

"Before the war, 70% of our entering students earned master's degrees, and 50% earned the doctorate. Since the war, these figures are 71% and

The first 15 classes of the Institute's 30 classes started with a low survival rate of about 30%, the figure rose steadily in about 12 years to a high of 80%, "a truly remarkable accomplishment in any graduate school." The class which entered the Institute in 1939 consisted of 15 men, of whom 14 received the ph.d.

In the first classes after the war,

about 60% of our entering students received ph.d.'s, and this figure dropped quite steadily over the next few years to 40%. It now seems to have levelled off at about 65%, "which represents a realistic and reasonable achievement," said Dr. Whitney. "Although we are presently headed for another dip in

Present Positions of Institute Degree Recipients Classes 1-15

General Administration

General Administration	
President Vice President General Manager	4 7 5
	16
Production	-
V.PMfg. Prod. Mgr. Mill Mgr. Supt.	5 6 7 3
	21
Eng'g. and Tech. Services	
Tech. Services Mgr. Other Tech Capacity	8
	15
Research and Development	_
V.P.—R. and D. Res. or Tech. Dir. Section or Group Leader Res. Chemist or Eng'r.	27 16 5
	51
Sales Other Out of Pulp and Paper	4 7 21 135
	100
Classes 16-30	
General Administration V.P. and Gen. Mgr.	2
Production	
Prod. Mgr. Supt. or Asst. Supt.	3 7
	10
Eng'g. and Tech. Services	
Tech. Services Mgr. Asst. Tech. Supt. Chemist or Eng'r.	9 3 8
	20
Research and Development V.P. and Tech. Dir. Res. or Tech. Dir. Section or Group Leader Res. Chemist or Eng'r.	1 12 15 32
	60
Other Out of Pulp and Paper	5 7
	104

... Executives at Appleton

the curve, it will be neither severe nor prolonged. To say that 50% of our entering students receive the ph.d. is true enough, but nevertheless misleading, because the entire span of years has covered both depression and war, and because we believe our recent experience to be more typical of what we should expect."

Geographic Considerations

In the first 15 classes, 52 students came from the Northeast, 33 from the South, and so forth, for a total of 201 matriculants. Of the students who came from the Northeast, eight are now in the Northeast, three in the South, 13 in the Midwest, etc., five have left the pulp and paper industry, and of the original 52, 36 received degrees. A similar pattern followed for later classes.

In the first 15 classes, 21 out of 135 have left the industry, and, in the last 15 classes, seven out of 104. This adds up to an over-all figure of 88% of degree holders who have found their careers in the pulp and paper industry. For ph.d.'s alone, the figure is even higher.

"It is interesting to note the extent to which our degree holders have wandered from their original home areas," said Dr. Whitney. "In the early classes, for example, of the 36 degree holders from the Northeast, five have left the industry, leaving a net of 31. Of these, only eight are presently in the Northeast. Of the Southern degree holders, only four of 15 are still in the South. The fraction is higher in the later class group, but is still less than half. Overall, of 206 degree recipients who came originally from the United States and are still in the industry, only 85 are now in their home areas.

"Each year we seek jobs for our students in the mills of our member companies. By far the most common request is that "We should like to employ John Smith this summer because he comes from our area and so he would be more apt to come back here for a permanent job." Actually, the odds are about two in five that he will return to his home area, and much smaller that he will take a job in his home state or community."

"It is of course highly desirable that we maintain good geographic spread of students. Unfortunately, qualified graduate students are not so plentiful that we can make choices on a geographic basis. Even at odds of two to five, we believe it necessary that major papermaking areas be well represented in our student body. The importance of the Far West and of the South as papermaking areas, for example, makes it highly desirable that these areas supply more of our students than in our early years, and we have been having some success in realizing this goal."

Regarding student marriages, he said of our present student body of 65, 44 are married, and 33 of these families have 56 children. This has presented some problems of adequate housing, in summer employment, and on the permanent employment of our graduates. The influence of marriage on scholarship "is all good."

"Occasionally we have complaints

"Occasionally we have complaints about the type of jobs our graduates accept. The most common are that 'too many of your graduates go into research and development,' and 'not enough of them go into research and development.' Others are that 'not enough of your men are interested in eventual top management positions,' and 'you should not permit your graduates to leave technical jobs for management positions.' In the latter case, we wonder just how we are supposed to prevent it! More of our men are in research and development than in any other area (see charts).

We hasten to point out that we do not believe a man's contribution to his company can be assessed only by his job title or his administrative responsibility."

Electrophoresis and Ultracentrifuge Have Become Valuable Research Tools

John Swanson, chief of physical chemistry at the Institute, conducted the panel on specialized new research equipment—revealing new inventions and much higher cost equipment.

"Our labs occupied the wrestling rooms across the street in Alexander Gymnasium 31 years ago, and all the equipment cost only about \$50," he recalled. "Dr. Otto Kress was the first faculty member and technical director, and he was followed by an organic chemist, Dr. Harry F. Lewis, and a physical chemist, Dr. Ben W. Rowland.

"The rented quarters housed the Institute for five years. By the fall of 1932 the Kimberly Memorial Library had been completed and the staff had increased from 4 to 11 and the student body from 2 to 26. It was during this time that Dr. Westbrook Steele was busily scouting some of the big manufacturing companies, establishing cooperative agreements in exchange for

certain much needed pieces of scientific equipment.

"Today the mathematician uses electronic computers which cost almost as many dollars as the digits they can handle. The biologist and physical chemists require electron microscopes, ultracentrifuges, electrophoresis and x-ray and electron diffraction equipment, radioisotopes, and many other very expensive precision devices. The physicist who probes into the structure of matter must have mass spectrometers, atomic reactors and particle accelerators which, in addition to their tremendous initial cost, require large budgets year after year just for maintenance."

just for maintenance."

Dr. Carroll L. Garey, physical chemis ry section, then described the x-ray diffraction—new tool of research. "To actually stand beside one or two cellulose fibers or pieces of pigment in a paper seems, at first glance, to be somewhat silly. Yet we can figura-



SWANSON

tively almost do that today," he said.

"Let us imagine for a moment that it is possible for us to get inside this paper product, to casually stroll around among the fibers, fillers, etc., that are present and to take a close look at what we find and how the materials are placed. The x-ray diffraction tool is a useful probe to examine not only what is present in this mass but also to give information as to what it means."

It is now difficult to keep a trade "secret" from this "prying eye" even

though the materials cannot actually be seen, he said.

A recent development in the use of x-ray diffraction has been in the determination of the relative direction in which the fibers lie in the plane of a sheet. Rotation of the plane of the sheet through the x-ray beam permits measurement of the relative angle of fiber orientation by a study of beam intensity since the reflection is directional. The need for further development of this technique is apparent to many for a correlation with the use of the Instron Tester for this same general purpose.

The x-ray diffraction technique has been particularly useful in identification of the crystalline pigments and by proper handling of the samples, we have been able to tell whether a given substance is present as a filler or is in the coating. The various forms of such materials as titanium dioxide, calcium carbonate, and calcium sulfates can be identified and located in the paper in quantities even less than

0.25%, he said.

Electron Microscopy

Dr. Richard Nelson, physics dept., then discussed electron microscopy, making possible the direct examination of objects, which may be as much as 200 times smaller than those which can be recognized as extended objects in optical microscopy. Moreover the objects studied need not possess periodic structure. As compared with the older and invaluable method of x-ray diffraction there is thus a difference in aim and in materials; and while both scattering and diffraction phenomena play a part in each method, the respective applications are quite different.

He showed its use with slides.

Light scattering techniques were described by Harold Swenson, of the cellulose chemistry section. Lord Rayleigh, in 1871, started his investigation of the theoretical and practical aspects of light scattering.

Rayleigh's theories were developed for small particles and it is only recently that further development (for the most part due to work begun by Debye in 1944) has led to the possibility of measuring the scattering from large molecules in dilute solution, said Mr. Swenson.

Light Scattering

"At present studies have been begun with light scattering and with the ultracentrifuge on hemicelluloses extracted from sprucewood," he said. "We have found that the molecular weight obtained by these two physical methods agree quite well. We have also found that the molecular weights are a good deal higher than have been previously reported by the osmotic pressure method commonly

"The light scattering and centrifuge methods supplement each other. By light scattering one obtains an idea of the size as well as weight of the molecule, but one cannot get an idea of the distribution of molecular sizes in the sample nor can one detect whether a sample is made up of two or three species of quite different molecular weight and with different characteristics. This can be done with the ultracentrifuge. An example of this was the discovery by centrifuge of a small percentage of very heavy material in hemicellulose samples. We do not know thus far whether this material is cell debris, an aggregate of some sort, or whether it is an actual high molecular weight polymer.

Next speaker, Dr. S. F. Kurath, of physical chemistry, reported on elec-

trophoresis.

Useful Tools

Two extremely useful tools for the investigation of the physical properties of polymers are the ultracentrifuge and the electrophoresis-diffusion apparatus of our Calder Plant Biochemistry Laboratory," he said.

The ultracentrifuge differs from the ordinary centrifuge in several important respects. The most striking difference is that the ultracentrifuge subjects samples to extremely high gravitational fields. We carry out routine experiments at gravitational fields of 256,000 times gravity. Centrifugation is performed in a specially designed centrifuge rotor. The rotor is constructed of aluminum alloy and is built to hold a small cell approximately 41 grams in weight. Molecular weights are determined on polymer solutions placed within the cell

At a top rotor speed of 59,680 rpm. the cell is subjected to a force of 24,000 lb. or 12 tons. At these gravitational fields one is very close to the failure strengths of most ordinary materials of construction. In fact, at the highest gravitational fields we are within 80% of the stress necessary to cause rotor failure. Since we have abandoned the common engineering safety factors, it is necessary to provide other safety precautions. As a result, the centrifuge rotor is placed within a cavity and is surrounded by 2-in. armor plate.

The second method one can use in examining the polymer content of paper is to study its electrophoretic be-havior," he said. "In electrophoresis we rely on the fact that certain molecules in solution carry an electric charge. As a result, they can be made to migrate in an electric field. Those molecules with the largest charge move the fastest and can be distinguished from their neighbors.

'In the electrophoresis apparatus all experiments are carried out in special cells. The cells are U shaped and are fitted with optically perfect quartz faces. The experiments are carried out under conditions of carefully controlled temperature and a carefully regulated current is supplied to the cell. The optical systems are similar to those used in the ultracentrifuge and serve the same purpose. That is, they serve to measure molecular concentration as a function of position in the electrophoresis cell.

"Electrophoretic and ultracentrifugal techniques are extremely useful since polymer samples may be subjected to physical analysis without resorting to lengthy physical separation procedures. They are our most valu-

able research tools."

High Speed Motion Pictures

James W. Gander, containers section, then reported: "One technique which has only recently taken a prominent place in both the mill and the laboratory is high speed motion pictures. At the risk of appearing contradictory, I shall also call it 'ultra slow motion photography.'

"Slow motion photography of the newsreel variety is achieved by taking the pictures at a rate of perhaps 64 pictures per second and then projecting at the conventional rate of 16 per

second.

Through major changes in camera design (involving substitution of a rotating optical prism for the conventional shutter and improvement in film transport) it is now possible to greatly extend the principle of slow motion movies. (He showed motion pictures have been taken at the remarkably high rate of over 5000 pictures per second.) By this means, an event which happens in a fraction of a second can be lengthened to a matter of minutes of viewing time. Accordingly, motion which is too elusive for either the mind or eye to comprehend in natural life can now be captured on film and viewed carefully and in detail at a seemingly much reduced speed."

Many Uses

The uses to which this tool has been put are many and varied, considering its relatively recent appearance in the laboratory and the mill. The transfer of the coating film from roll to paper, testing of sack paper strength, sack impact tests and the corrugating operation were shown in high speed pictures.

... Executives at Appleton



VAN DEN AKKER

Cooperative Research Takes Unexpected New Direction

General policies evolved over the years in handling the increasing number of cooperative research projects for two or more companies—the organization of these group projects—was a panel subject. Wendell Smith, secretary of the Institute, laid the groundwork, explaining how multiple contractual relationships are handled. Rights and equities in patents, publications, termination, etc., become more complex. There are various types of group-financed projects. He predicted the interest in such projects will increase.

Dr. E. J. Jones, physical chemistry, went on with the subject, pointing out such projects should be ones that few individual companies would want to tackle, that it should provide tangible results at low cost per member, etc. He cited a project which used an advisory committee and a project coordinator, to speed up progress.

Ed Dickey, organic chemistry section, discussed a premature venture into such a project. A pulp evaluation project, he cited, raised thomy problems (analysis of content was inconclusive) but intensified interest in relationships between fiber components and pulp properties.

Result of Project

Dr. Van den Akker, final speaker, then revealed how a successful result of the project was in the realm of individual fiber strength relation to paper strength. Interfiber bonding was considered the governing factor in paper strength, he said.

"The case presented by Ed Dickey is very interesting; the potentially valuable chemical approach was premature, both the point of view of the program and of the chemistry of hemicelluloses; also, the approach

was at a different level from that of nearly all the other phases," said Dr. Van den Akker. "The latter were at the level of the behavioral properties of pulps, whereas a study of the role of hemicelluloses is at a more fundamental level, and should not be conducted-as one sees by hindsightwithout relationship with other studies at the basic level. Now, a number of years later, it seems desirable to have another go at the role of the chemical properties. As a matter of fact, we are now generally in a stronger position to study many fundamental aspects of pulp and of individual pulp fibers on the recently established group program on the 'Dynamic Behavior of Pulps.



THODE

Team Research Is Aid To Communication

The benefits derived from "team" research were described by Dr. E. Thode, administrator of engineering and technology, and three students: William H. Trice, from Syracuse University; John Vaughn, from Tulane U., and Dave McMaster from Georgia Tech.

"Learning through doing," is the way Dr. Thode pictured their activity, but he also stressed the "development of interpersonal relations and communications."

"After all, only the individual can be creative, but nevertheless only the group—ultimately society—can make use of these ideas. The individual must transmit them to his fellows. Group research has helped our students appreciate better the principles of effective interpersonal communication."

Brought out in the talks were some interesting points: By resorting to grouped student research, it is possible, to bring enough brains and manpower to bear upon a very complex

problem, comprehensive enough in scope, to extend the team into diverse aspects of the subject matter within only 12 weeks.

"Often the groups showed a great deal of ingenuity in the planning of the research programs. Some of these programs utilized the more fundamental techniques available only at a basic research center such as the Institute. Of these were electronmicroscopy, measurements of swollen specific volume and specific surface, pulping rate studies with an isothermal digester, the determination of fiber and bonding strengths by the newer methods, the use of the IBM 610 computer for statistical evaluation of the basic properties of pulp, and others. The utilization of these advanced techniques gave a better insight into the direction future research is taking in industry and so an appreciation of the problems involved in trying to explain the behavior of pulp and paper in terms of their fundamental properties."

Pulp and paper tests in order to fully explore the blend characteristics were treated statistically to produce an analysis of variance of each of the main factors and any possible interactions. Several conclusions pointed to the differences in the blend factors affecting the pulp and paper tests. A few of the blend characteristics: "A" percentage gum, "B" amount of pine refining, "C" amount of gum refining interaction; "AC" the composition-gum refining interaction. From the analysis of strength it was possible to show the small effect of blend composition, the important effects of individual refining, the significance of the "AB" interaction and the unimportant effect of the "AC" interaction.

Likewise, the blend characteristics were analyzed for the pulp measurements; for instance the freeness test.

Doctoral Research Work Discussed by Students

In another panel, a group of students explained their thesis work. Peter N. Yiannos chose the subject "Molecular Reorientation of Some Fatty Acids When in Contact with Water." James L. Parker discussed his study of "Effects of Ethylamine Decrystallization on the Viscoelastic Properties of Paper." William Wadsworth's doctoral research was on "Synthesis of Carbohydrate Materials." And R. Estridge's was on "Initial Retention of Fibers by Wire Guides."

Bleached Pulp Quality Control

. . . results from two-year-old automatic calcium hypochlorite system at big Crofton kraft mill of B. C. Forest Products Ltd.

By ALLAN H. DOWSLEY
Bleach Plant Chemist
British Columbia Forest Products
Ltd.

and
E. PAUL DUNCAN
Supervisor, Technical Services
Western Chemical Div.
Hooker Chemical Corp.

 Considered one of today's most efficient automatic calcium hypochlorite bleach liquor units is the one in operation at the Crofton, B.C. bleached kraft pulp mill of British Columbia
 Forest Products Ltd. It has been operated continuously since January 1958.

The basic system was developed for the pulp and paper industry by the Western Chemical div., Hooker Chemical Corp., and carries U.S. Patent No. 2,889,119 and Canadian Patent No. 571,741. Cooperating in design details for the Crofton installation were engineers from B.C. Forest Products, H. A. Simons Ltd. (Vancouver) and Hooker Chemical.

In the design of the compact multistage bleach plant at Crofton, it was logical to specify the automatic in preference to the conventional batch hypochlorite system. The potential advantages proved out. Considerable savings in space were realized; capital investment was lower, and little or no operating labor has been required. At the same time, hypochlorite strength and quality have been held uniform. resulting in better control of bleached pulp quality.

Production, Strength Maintained

Bleach liquor production may be maintained at any desired rate from 40,000 to 200,000 gals. per day. Bleach liquor strength may be maintained at any desired level from 15 to 50 gm. per liter available chlorine. Excess alkali may be maintained as low as 0.2 gm. per liter, or practically at the endpoint. Final continuous classification of the bleach liquor in a bank of small DorrClones results in a semi-clarified product of uniform quality.

The accompanying flow sheet shows all the associated equipment. Physical arrangement of the components allows maximum use of space and facilities. The lime slaker is located in the recausticizing building some 500 ft. from the bleach plant; other equipment units are located in the bleach plant building.

Slaked reburned lime and chlorine gas constitute the raw materials. As required, the recausticizing operator

starts or stops the DorrCo slaker. Slaking, classification, cooling and transfer to strong lime slurry storage are carried out automatically. Hot slaked lime at 10% concentration flows to the compartmented surge tank. One side of this tank feeds a pump supplying slurry at 80 gpm and 45 psig to a 6-in. DorrClone for classification. Rejects are removed from the system by discharging to the recausticizing slaker, while accepts smaller than 50 microns flow back by gravity to the other side of the compartmented tank. This side feeds another pump, which circulates the classified lime through a shell-and-plate cooler, reducing the temperature to about 90°F, and directly to storage through the 500-ft. transfer line.

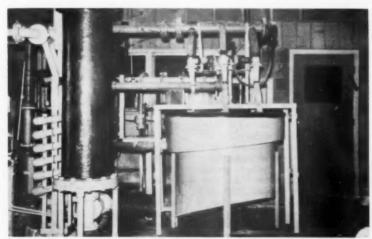
Ten-percent slurry from the 10,000-gal. storage tank at ground level is continuously pumped to an automatic dilution system on the third floor of the bleach plant directly above. A density controller regulates the flow of dilution water, and a level controller on the 8,000-gal. dilute slurry storage tank regulates the flow of 10% lime slurry. Concentration is maintained at 3.6% calcium hydroxide.

Emergency Automatic Control

The dilute slurry storage tank also functions as a safety blowdown tank for chlorine, thereby providing a most convenient source of alkali for absorbing vent chlorine from tank cars or from handling equipment. The alkali capacity is sufficient to absorb all the chlorine holdup in the mill system in an emergency. In case of malfunction in any part of the automatic hypochlorite system, the same tank may be used for batch makeup; this never has been necessary at Crofton.

Dilute lime slurry at about 70°F is pumped to the hypochlorite reactor at a normal controlled rate of 80 gpm. An additional 50-100 gpm is recycled through a by-pass pressure control valve to the recycle tank, or through the blowdown injector on the chlorine vent system. This by-pass flow is always available to drive the blowdown injector for emergency evacuation of the chlorine system.

Chlorine gas is supplied to the reactor at constant pressure from the main chlorine vaporization station.



FORCED CIRCULATION REACTOR, DorrClone manifold and settling chamber. In the background: main bleach plant chemical preparation control room.

... Bleached Pulp

The controlled flows of dilute slurry and chlorine gas are brought together in a mixing tee, and the mixture immediately enters the compact forced circulation reactor.

This reactor, of the latest design, offers advantages over previous coil and draft-tube hypochlorite units. The unit is only 5 ft. high for easy installation and maintenance. It combines the features of pressure reaction, multiplepass, short retention time, minimum scaling and provides a capacity range of from 30 to 140 gpm. After a reaction period of some 15 secs, under 35 psi, the 30-gm.-per-liter hypochlorite solution with a small percentage of unreacted lime flows at 80 gpm and 35 psi directly to six 2-in. porcelain DorrClones for classification.

Overflow product at about 88°F flows by gravity at 60 gpm to one of two 16,500-gal. storage tanks. A platinum-silver electrode pair continuously measures the oxidation potential of the product. A Foxboro dynalog oxidation potential recordercontroller automatically controls chlorine flow to the reactor, holding a steady and reliable hypochlorite endpoint.

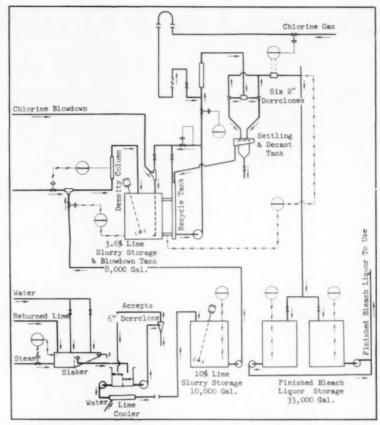
Clarification in Storage Tanks

The finished product is classed as semi-clarified, containing about 0.2% by weight inert solids, all of which are smaller than 20 microns. Although this very small amount of inert solid material is harmless, it gives the bleach liquor a milky appearance because of its flocculent nature. To help clarify the liquor, the product is allowed to settle in the storage tanks.

Underflow reject slurry (containing about 1% solids) from the 2-in. Dorr-Clones drops by gravity at a rate of 20 gpm into a 200-gal. settling and decant chamber. Decant containing small-particle calcium hydroxide flows by gravity into the recycle tank and passes through the reaction cycle again. Large lime particles and inert solids are purged from the settling chamber periodically.

A temperature differential recorderalarm, located in the circuit between starting dilute lime slurry and finished hypochlorite product, measures the reaction heat formed by a temperature rise of 1.8°F for each 3 gpl of available chlorine formed. The 30-gpl product results in an 18° temperature increase. This provides a reliable means of checking accuracy of lime dilution and serves as a warning signal of any malfunction in the automatic chlorine control circuit.

The reactor, classifier, settling



AUTOMATIC SYSTEM at B.C. Forest Products is said to save space, cut down on capital investment, while maintaining hypochlorite strength and quality.

chamber, dilute slurry tank, recycle tank, control valves and control panel are all closely coupled. They are located on, and immediately below, the bleach plant operating floor, where the bleach plant operator can easily start and stop the system. Start-up requires about 2 min., and little or no attention is required during operation.

One Problem: Scaling

Materials of construction include Saran-lined steel pipe for wet and dry chlorine gas service; corrosion- and fire-resistant Hooker Hetron polyester resin reinforced with Fiberglas, polyvinylchloride, and Saran- or rubberlined steel for various parts of the reaction equipment and hypochlorite piping. To date, all materials have given good service in their specific applications.

In two years' operation, only one serious problem has been encountered: scaling of reaction and transfer piping at an unpredictable rate. This scale formation, a chemical precipitate, is a function of carbonate and carbon dioxide content of the lime feed. At

times, calcium carbonate scale buildup was extremely severe, necessitating thorough clean-out of the reaction equipment every few days to maintain production. To reduce this scaling extensive field tests were carried out prior to design of the present reaction and classification equipment. The re-cently-installed forced circulation reactor, small DorrClones and settling chamber appreciably reduced the scaling problem; however, this new equipment did not eliminate the milky appearance of the product. Further work is underway to improve lime quality and to reduce the inert flocculent solids in the hope that a clear finished bleach liquor may be produced.

Installation of the automatic continuous system at Crofton proved to be a wise decision. Operating and chemical costs have been held to a minimum, while at the same time the dependable supply of uniform-quality bleach liquor combined with chlorine dioxide helps to assure the exceptional quality of bleached Crofton Kraft





FACE TO FACE: Students (1) of University of Maine's Pulp and Paper course put industry reprensentatives (r) under a barrage of questions on recruitment and promotion policies.

Attracting Tomorrow's Leaders

University of Maine's annual Pulp & Paper Foundation Days help industry and students get better understanding of needs of each

· As the pulp, paper and paperboard industry moves from the era of craftsmanship to the scientific age, as the art of papermaking changes to a largely automatic phase, the manpower needs of the industry become more exacting and more acute. Since the paper industry is not alone in this quest, the competition is keen.

This is why in various centers of learning across the country, and in fact, throughout the world, special schools and courses in pulp and paper technology have been established to attract and to train young men for positions of leadership in the industry. Prominent among such endeavors is the Maine Plan at the University of Maine at Orono, Maine, made possible by the Pulp and Paper Foundation. Since its inception in 1950, with six students, the Foundation has helped 112 men to take the fifth year course in pulp and paper.

Reports J. L. Ober, president of the Pulp and Paper Foundation and retired executive vice president of Scott Paper Co., "The men continue to give a good account of themselves in the business world, Reports on these boys are excellent and they are making a real contribution to the industry. The aims of the Foundation are being realized and the Foundation itself has focused the attention of many young men on opportunities in the paper industry.

Each year the University of Maine

holds an open house in cooperation sell us on that. We wouldn't be here with the Foundation. This year's, the if we didn't feel that way." ninth, was held on April 29 to 30 and it is considered by many to be one of the best attended by leaders of the industry. This is proof says one professor, that the industry is solidly behind such training. During the Open House days, students rub elbows with industry leaders.

Open House

The Open House starts with inspection of some of the special research projects students are engaged in. Pride of the Foundation is the new paper machine, a gift of the late Hugh J. Chisholm of Oxford Paper Co. The paper machine seems to have a special fascination for mill representatives who cluster around it watching the students sweat through the startup procedures. As one onlooker remarked, "I would have been a complete coward and gotten the machine started before they came in.

During the cafeteria style luncheon, students sit side by side with the industry's top echelon. Luncheon speakers recount their reasons for entering the industry, tell why they believe it is a good industry to work in. But as one student in the afternoon discussion remarked, luncheon speakers all seem to be trying to make the point that the pulp and paper industry is a good industry to work in. You don't have to

In the afternoon sessions, students explain their reasons for taking the fifth year course and how they were attracted to the industry and what their future plans are. It is interesting to note that environment (a nearby pulp and paper mill) and relatives and friends working in the industry are predominant reasons given by students for being attracted to the industry

Although the Foundation stresses that it is not regional, many of the students do come from the State of Maine, and this is natural. The Foundation realizes this and a campaign will seek fuller cooperation from more companies in the industry.

An innovation in this year's Open House was introduced by Hugh H. Morton, chairman of the publicity committee and production manager at S. D. Warren, Cumberland Mills, Maine. His approach was to write to managers of Maine pulp and paper mills in this vein, "What makes a topnotch football team? Usually a good selection of high school players-boys with plenty of brawn and a desire to win. Our industry needs a topnotch papermaking team, so why not go to the high schools for exceptional players with brains as well as brawn and the will to succeed. As a leader in your community maybe you can interest a couple of exceptionally

... Open House

capable boys to join our growing and dynamic industry."

Chairman Morton urged that the schools be contacted to select two outstanding boys interested in advanced education of a technical or general nature, and offer to sponsor the boys' trips to the Open House at the University. Response was good and about 10 companies participated.

In the students meet the industry session, a panel of industry leaders answer questions of the students and vice versa. Here are some of the students' questions: "What is the purpose of tests given on the first interview? It should be a 50-50 proposition where we get to know the company and the company gets to know us." "Why do companies ask what do I want to do. Do you think that a graduate has the background and experience to answer

this question?" One mill representative explained it is easier to channel an employe's activities or work into specific areas of work if the company knows where his interest is.

"What is the greatest limitation to development after two years? Is it personality or technical ability?" One answer: "Demonstrate as wide a range of responsibilities as you can. Show additional capacities by outside activities such as community work. Show a willingness to drive yourself, to want to work and get ahead." Another: "You have to sell and demonstrate leadership to regular mill hourly employes. You can't be promoted and hold down a responsible job if these men won't work with you."

Concerning multiple interview trips during which a student lines up several companies for interviews, the students asked how to charge the expense of the trips, whether each company should be billed for the full trip or whether the student should have them share the cost. Some students reported that a few companies were rather free about this and paid the expense of the trip, disregarding the fact that other companies were visited. But Dean Evans explained that according to a college recruitment bulletin, this was not ethical and that the charge should be apportioned. One mill representative reported that his company did not hire a student because the student had not been honest in his expense account.

Students are also anxious to know how long they should be expected to wait until a hearing. Not longer than has been promised, was the answer. Students were asked if they tend to tailor their answers during the interview and they said they did. They lean away from areas they think the company doesn't like. "Don't tell them unless they ask you," was one student's reply.



DR. THIESMEYER: ". . . tremendous opportunities for savings in wood procurement . . ."

By LINCOLN R. THIESMEYER President, The Pulp and Paper Research Institute of Canada

Excerpts of Dr. Thiesmeyer's talk at the University of Maine Pulp and Paper Foundation banquet.

• I don't think it is necessary to join competition from other industries, such as plastics. I think we can beat them, because I think we can produce much better products than we are producing today. At the moment our research is oriented toward drastic cutting of the cost of this industry's operations; and very marked improvement, not just slight improvement, very marked improvement in properties of material which we furnish to converters for making the end product.

When your objective is to cut costs by large numbers, rather than by minor percentages, it may be necessary to take a rather radical and

A Hand in Things to Come

President of PPRIC cites steps the industry must take to beat its competition

new approach. It isn't sufficient to simply bring the changes on variables in a process which is already limited by the kind of equipment in use, so big that it is very inflexible and difficult to deal with it. Such apparatus will turn out a tremendous quantity of product. But one doesn't dare interfere with it very much. The operators will prevent that.

In a large part of our production, we don't have to work too hard because we have a tremendous market to serve; and when one customer isn't too happy, there is another one right around the corner. Now if that has truly been our attitude, it's fair to say that the time is fast disappearing when it is possible to have that kind of an attitude with impunity.

We must think of going after things in a different way To do that intelligently it's necessary to know much more about what goes on in conventional practice, either to improve the existing practice to some degree or to find a new and better way for doing the same thing.

While there is still opportunity for really large dollar savings in pulping, papermaking, bleaching and other things which go on in the manufactuing plant, there is tremendous opportunity for savings in wood procurement. Only recently have very much science and technology been applied to this field. Yet, the major part of the costs in the woods would appear to be, in most cases, within the first 600-ft. from the tree. Much effort is going into mechanization, to reduce or eliminate some of the hand labor necessary, to handle larger quantities faster, etc. This must continue.

But, there's another thing that might be done. This is to eliminate all handling and re-handling and handling again of the individual sticks of pulpwood in river driving; all manpower involved in the sweep, all sinkage losses, all tying up of wood inventory along the river course, all towing across sections of lakes where there have been hydro power developments on the river since the logging operation started, etc.

Chipping In the Woods

Such a change might be by chipping the wood in the bush and sending it overland in a water slurry in pipelines. We put in a loop 528-ft. long, of 8-in. pipe and started to

send chips in a water slurry through it. Conventional wood chips were used. We took the chips out at various stages of transit through this pipeline and examined the product, both mechanically and chemically, as compared with products from the same chips which had not gone through the line.

We found it is possible to put 47% by volume of wood through such a line. This is way beyond what we had thought possible on theoretical

grounds.

The power required goes up fairly steeply above 30%. So we think that industrial lines will probably be operated in the range of 25% to 30% by volume. We could thus put through an 8-in, pipeline some 700 tons b.d. wood/day, enough to feed a 350-ton

chemical pulp mill,

We found moreover that this slurry of wood and water behaves essentially as if it were water alone. The amount of damaged wood was negligible, after miles and miles of severe treatment in a pipeline. We built ours in such a way that the chips would get drastic treatment, much worse than they would get in a commercial line. For example, we put right angle bends everywhere, although you wouldn't think of having right angle bends in a commercial line.

We found that the deterioration of pulp properties after passage through the line was, in some cases, with:in the limits of error in making the measurements. We can now tell the industry, that it can with considerable confidence put in pipelines where

applicable,

For a hypothetical case, we calculated some of the costs that might be involved. We found it would be possible with a 6-in. pipeline to handle 350,000 cords of wood a year and that the line would amortize itself in a sufficient period of time. One of our companies is considering putting in an 8-in. pipeline across a river from a sawmill to a pulpmill. They would lay it on the bottom of the river and have no concern about freezing.

Rhodesian Cellulose Co, has had a line designed 15 miles from one direction, 20 miles from another to a trunk pipeline of 6 miles to a mill in rugged country. Here the profile is such they will not need to do any pumping. Gravity will do the job. One of our companies is considering a 50-mile pipeline from a plateau where there are abundant water and wood, down a 1500-ft. drop to a mill at tidewater. They are even thinking of generating power by putting the slurry through turbines at the end of the line.

We calculate that if only 10% of the wood in Canada were to be sent



PRACTICAL EXPERIENCE in paper machine operations is one advantage of equipment supplied to students by Pulp and Paper Foundation at University of Maine. \$25,000 paper machine is gift of the late Hugh H. Chisholm of Oxford Paper Co.

in by pipeline overland, the annual savings to our industry would be about \$15 million.

The chemical nature of the constituents of wood is still very imperfectly known. A fair amount is known about lignin. But still, there are unknown and there are other components of wood and bark that are not currently used. They need to be investigated. We know that lignin in its native state in wood is very light in color, almost white. Yet, when we put it through our conventional practices, we end up with a material that is far different from the lignin we started with. Cellulose in wood has almost the strength of steel. Lignin comes out in quite a different form, generally darkened and in the case of unbleached kraft. in a condition very difficult to remove by expensive bleaching operations, Are these changes really necessary? Are the things that happen in our chemical pulping operations essential to pulping?

We are looking much more closely at the different forms of physical damage which wood suffers long before we have it in pulp form. Damage, for example, done in the chipper.

We are also studying the reactions that take place in pulping. How necessary is it to wait in the case of kraft pulping, until some of the more easily accessible carbohydrates have come out first? In kraft pulping literature, everybody agrees the first thing that happens is some of the easily accessible hemicellulose has come out first, and then finally lignin starts coming out. Is it necessary to wait? Can't we somehow contrive to get that lignin out simultaneously with

hemicellulose?

Another thing we would like to do is prevent lignin from polymerizing, from condensing, from taking on the less soluble and less-readily-dissolved condition which requires the complex bleaching operations. Because after all, bleaching is nothing more or less than a continuation under different conditions of chemical pulping. The ideal would be to get out the less readily removed lignin and thus to bring up the color and also to take out some of the side reaction products which develop during pulping; things that have nothing to do with the main objective of pulping but happen to take place because chemicals are present and the time is long enough.

What about these dark discoloring agents which create the need for extensive bleaching. Why can't we pulp in such a way that hardly any bleaching is necessary? The present trend is to go to more and more bleaching stages with diminishing returns. The driving motivation is to get even better, even slightly better but still better, quality. Perhaps we could get those qualities just as well without going through all this by pulping differently. And we may even be able to do this, not with some exotic new chemical or with some strange new form of wood, but with conventional mill chips and conventional liquors and equipment that are not too different from those we are already using. We have made some significant progress in these directions. We believe that pulping is going to be done in very short cycles on a continuous basis, starting with conventional chips and conventional liquors but in cycles

... Open House

of less than half an hour, indeed, some of them as short as 10 minutes or even 5 minutes for high yield types. The bleaching of these pulps will be extremely simple because we have avoided some undesirable reactions we have been accustomed to accepting.

Revolutions in Papermaking

If we are going to revolutionize papermaking, let's do a good job of it. To get back to the pipeline. Now that we know we can put wood through a pipeline, several of our boys say there's no reason why this line shouldn't have some caustic or other chemical, introduced into the line near the mill end.

In papermaking, it doesn't make good sense to have whirling tons of metal pulling a few miserable pounds of product at any one instant. There ought to be a better way of doing it. We are driving in that direction and have some rather novel ideas which are being tested out.

We also have been doing a good deal of work in waste utilization. Here is a tremendous field for research. Do we need to make a product and then throw away about 30% to 50% of the raw material that we started out with. Does this make very good sense? Our approach to this is to wait for markets to develop.

We want to see what can be done with processing of the whole effluent to get something out of it the way the kraft industry does. We may destroy all manner of valuable chemicals which we know exist, but there is not much alternative under present conditions. The time will come when we won't be doing that. We may get cooking chemicals back and heat back. Not too many years will elapse before you will see some plants based upon a process we have developed. We call it the atomized suspension technique. (AST), and it is going commercial in a number of applications. It's not only applicable to the recovery of pulp mill liquors, but to many other things.

In Ohio, a plant is being built to

destroy the cyanide and bring down the chromic salts in the effluent from a metal plating operation using AST. The Green Bay Pulp and Paper Co. intends to use this process and are working with Blaw-Knox to determine the best construction material for the units they will put in. A number of companies such as Blaw-Knox, Lummus Co., Singmaster & Bryer and Infilco are working with us toward commercial use of AST.

Some day we may be able to back off on the operating conditions and take the lignin before it has been destroyed and put it through some such process as hydrogenation, money has been spent on the hydrogenation of coal. Nature manufactured coal by driving off hydrocarbons and moisture and bringing up the fixed carbon content. Hence, to make derivatives by hydrogenation of coal it is necessary to add a lot of hydrogen. But if we could start with lignin, which after all is the material coal is made from in the first place, and still contains a lot of hydrogen, we should get a much better yield of the product desired. This is for the future

French Visitors Tour U.S. Mills

A party of 26 leaders of the French pulp and paper industry made a three weeks tour of the United States from coast to coast during May and late April.

They were scheduled for visits to 17 mills in the fine paper, writing paper, printing paper, tissue and parchment and specialty fields. High speed and specialty coating, production of polyethylene papers and converting processes were among processes they were seeing.

A reception and welcome was accorded the group on Apr. 23 by the American Writing Paper Mfrs. Assn. Sponsors of the French group's trip was the French Printing and Writing Paper Manufacturers Association. In most cases the visitors were presidents or director-generals of their companies, and a few of the visitors brought their wives.

Conducting the tour was Emile P. Gaillet, West Redding, Conn., who represents the French association in the United States.

The French visitors were entertained at a dinner in the Warwick hotel in Philadelphia by The Black-Clawson Co. on the evening of April 28. On May 7, Beloit Iron Works of Beloit, Wis., played host to the French group. They also visited the

R. H. Donnelley printing plant in Chicago, the largest printing establishment in the world, where many American magazines are printed.

These are the paper mills visited: Mohawk Paper Mills in New York state; Crane Co., Esleeck Paper Co. and Crocker-Burbank in Massachusetts; Paterson Parchment Co., Hamilton Paper Co., Scott Paper Co. and Hammermill Paper Co. in Pennsylvania; Lee Paper Co., KVP Co., and Rex Paper Co. in Michigan; Bergstrom Paper Co., Gilbert Paper Co. and Consolidated Water Power & Paper Co., in Wisconsin (while a part of the group went to Blandin Paper Co. in Minnesota), and Crown Zellerbach and Potlatch Forests in California.



FRENCH INDUSTRY LEADERS on the West Coast: (left to right) Elden R. Knauf, president, Crown Zellerbach Overseas Corp., Ernest Simon, Paul Forest, Bonnet-Eymard, and Fred M. Sherman, West Coast representative, Reinhold-Gould, Inc.



IN WISCONSIN: (left to right) Emile P. Gaillet, West Redding, Conn., former French paper official who acted as interpreter for the group, Felix de Clinchamps, Henry P. Baldwin, vice pres. mfg., CWP&P and Rene Marsal, sec. Writing and Printing Papers group.

Planning Maintenance Work

A practical outline on how to schedule and control preventive and emergency industrial maintenance programs

By BERT CARSON Maintenance Planner Hudson Pulp & Paper Corp. Palatka, Florida

> (Written especially for PULP & PAPER)

· Industry today is realizing more and more the need for exercising more rigid control over its maintenance force.

The increase in larger and more complicated machinery has over the past decade demanded of the maintenance man greater technical knowledge and ability. The gradual automation of production lines has materially decreased the personnel required to not only maintain past production performances, but to exceed them beyond management's fondest expectation. The complication of this machinery has demanded the training of specialized technicians. Some maintenance supervisors are of the old school and have very little regard for records or efficiency. The only way is to obtain the services of experienced maintenance controller who has worked with maintenance problems and is fully qualified to estimate work orders.

An effective maintenance manpower control program depends wholly on the accuracy of the estimated manhours. If the estimating is 50% over (and this is not hard to do over a relative short period with the 2- to 3-hour jobs), the best of scheduling can only produce a 50% efficiency in the effectiveness of the crew.

The first problem the experienced maintenance controller will tackle will be the present crew alignment. Many plants are still holding to the crew alignment they started witharea maintenance. This organizational set-up served its day when the maintenance man was a "jack of all trades." Today, with modern machinery and the specialized technician, the area supervisor is far outclassed by many of the hourly paid people under his direct supervision, consequently, he is no longer giving orders but taking them. Therefore, he must depend on the specialist in each group to tell him why, when, and how a job should be done. The technician with a good knowledge of his trade is fast to spot the inability of the unqualified supervisor.

Centralize Maintenance

The remedy for this situation is to centralize maintenance. The only problem to face here, unless a company wishes to release a large percent of its maintenance supervisors, is to give each supervisor a trade examination and determine from this examination the trade which each supervisor is best qualified to handle.

Once the crew has been organized to where maximum efficiency can be expected, a means for obtaining this efficiency consistently must be devised. Here the maintenance controller can take over, with scheduled manpower control. There are several means available and most of them are good, however those practiced in one plant will not necessarily work in another. Several things determine the type scheduling which will best serve, such as: 1. Hours the plant operates; 2. Union management agreements; 3. Type, age, and condition of the equipment to be served; and 4. Storage capacities and locations.

Preventive Maintenance

A good preventive maintenance program is always in order, especially where a plant works maintenance people on a trouble call basis. These people are available for preventive maintenance inspections not less than 50% of the time. If this system is set up properly, one clerk can keep it up to date by spending a couple of hours each day posting, filling, and issuing inspection reports.

The preventive maintenance system should also cover oiling and lubrication. To set up the system, only three forms are necessary: 1. The equipment records card; 2. The equipment inspection card; and 3. The oiling and lubrication report.

Equipment Records Card

This is the base card and should be used for: 1. Recovering the maintenance history of the equipment; 2. Listing each inspection point, and the frequency for inspecting; 3. Signaling the next inspection; 4. Listing points of lubrication, the frequency for lubricating; and 5. The type



Bert Carson

lubricant to be used.

This form should be designed to fit a visible index file. A separate form should be used on each piece of coded equipment.

The written procedure, instructing in the proper use of this form, should be specific in every detail, covering: 1. Duties of the posting clerk; 2. Disposition of the card when a. The equipment is sold or scrapped, or When no space is left for posting; 3. Method for transferring card when the equipment is moved; and 4. Instructions for signaling inspections.

Inspection Card

There are at least two methods for scheduling the preventive mainten-ance inspection, both are good. The prime factor in determining the one which best fits a given situation is the location and type of equipment. If the equipment to be inspected in a given area requires virtually the same inspection, the form should be designed to cover more than one piece of equipment. Here the maintenance controller must keep in mind that each piece of equipment must be identified separately, for accurate records. Groups of electric motors, certain type pumps and speed reducers will work nicely on this type form.

Where the equipment to be inspected, the type inspection or frequency differ, the form should be designed for use on a single piece of equipment.

This form will be the maintenance mechanic's instructions for: 1. Performing the inspection; 2. Reporting any adjustments made; 3. Relating for record the condition; and 4. Re-* porting any major repairs necessary.

. . . Planning Maintenance Work

The written procedure should cover method: 1. Of scheduling; 2. Performing; 3. Reporting; and 4. Recording the inspection.

Stating in detail the duties and function of: 1. The posting clerk; 2. The maintenance scheduler; 3. The maintenance supervisor; and 4. The inspecting mechanic.

Oiling and Lubrication Report

Oiling and lubrication may be scheduled more efficiently if the form is designed to cover several pieces of equipment. Since the type lubricant used and the frequency of inspection is the same, it matters little if the equipment be from different groups, ie. pumps, speed reducers, electric motors, etc. The thing to keep in mind when designing the form is to provide for individual identification, ie. by code number.

The written procedure for oiling and lubrication can very well be incorporated with the preventive maintenance inspection procedure. The writer should take care to spell out the details separately since the type inspection differs.

Another method of scheduling which has proved not only to be a means of utilizing idle maintenance time, but highly lucrative insofar as capital savings on materials and supply purchases are concerned, is the salvage program.

Salvage Program

The reclaiming of usable parts and supplies through a systematized program requires skillful organization. To dismantle a few joints of pipe and reclaim the fittings for future use does not constitute an organized program.

The salvage program should not only include the reclaiming of usable parts and supplies, but the repair and reconditioning of parts and equipment where the restoring of worn pieces will return the item to a like new condition.

The first consideration in writing this procedure will be to set up a system of keeping cost. The salvaging of equipment does not necessarily mean it has been done so at a profit.

Since the maintenance organization has no means for pricing, storing, or leasing of salvaged items, it is necessary to use the plant storeroom for this purpose. The additional work involved will be minor and the increasing of the storeroom staff unnecessary.

The procedure should provide separate standing job orders for each -

item or like groups of items to be salvaged, such as: 1. Pipe from ¼-2 in.; 2. Pipe from 2-5 in.; 3. Pipe from 5 in. and above; 4. Fittings from ¼-2 in.; 5. Fittings from 2-5 in.; 6. Fittings from 5 in. and above; 7. Motor starters, contactors, instruments, etc.

When a mechanic spends time or withdraws materials from the storeroom to reclaim an item, the standing job order assigned should be used with the maintenance cost center. In this way, all costs involved against an item or group of items will be accumulated and charged to maintenance.

The reclaimed item should be checked into the mill storeroom on a maintenance credit slip, using the same job number. The stores clerk should credit maintenance with the vendor's price for each item returned.

At the end of each month, the maintenance controller can determine from the cost report the value of the salvage program. From the same report, he can determine which items are more costly to salvage than the outside purchase price. The salvage program handled in this manner will never be a liability. It must always be an asset.

Fabrication of Spare Parts

Many industries have long since realized that their maintenance people are capable of the fabrication of spare equipment parts which are equal to, if not better than, the manufacturer's. This applies especially to the shop machinist.

However, the fact to remember here is that the manufacturer is set up to produce these rarts on a production line basis. True, the sales commission, freight, and delay in shipment must be taken into consideration. The sales commission will be included in the manufacturer's price. The freight should be distributed by number of items shipped and included in the storeroom price. The stores overhead should not be included for comparison because we intend to stock the fabricated part.

With these thoughts in mind, we should establish a price for the item delivered to the plant storeroom. The cost of fabricating the parts should be kept by type part made. This figure will include the time spent, supplies used, plus the department overhead. It is these figures which should be used for comparison.

We will find that the mill can produce many items more economically than they can be purchased. However, there will be items that can be bought from the vendor cheaper. The plant would not wish to produce such items.

The written procedure for the fabrication of spare parts will be very nearly like the procedure for salvage, the difference being parts should be fabricated on orders from the storeroom, based on a minimum and maximum amount to be stocked.

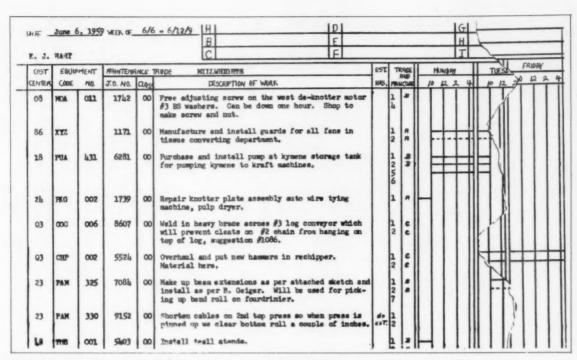
The scheduling procedures covered to this point are means for supplying work for maintenance people during their idle hours. The preventive maintenance inspections should, if at all possible, be scheduled to the shift maintenance personnel. The salvage and spare parts fabrication can be scheduled to either the shift or day maintenance people.

In most cases, if the preventive maintenance inspections are handled properly, this will be as much, if not more than, the shift people can handle and still answer their trouble calls. Therefore, the salvage and spare parts fabrication should be scheduled to day people. These items should be reserved for fill-in work, a job that will be constructive, yet one whereby





MAINTENANCE RECORDS ARE IMPORTANT. Left, records clerk posts maintenance costs to equipment records. At right, compiling daily work schedule.



SHEET REMOVED FROM WEEKLY WORK SCHEDULE. The foreman writes in the mechanic's names.

a small percent of the crew will be available for emergency breakdowns.

The Daily Schedule

The daily schedule should never be used as a sole medium for scheduling an entire maintenance crew, for the following reasons:

1. To consider and properly plan an 8-hour work day for each member of the crew on such short notice would be prohibitive.

2. A one-day notice to department superintendents in securing production equipment for repairs is insufficient.

 A one-day notice to the maintenance supervisor where scaffolding and prop. work are necessary can only create confusion at the scene of the job.

4. A one-day notice to the storeroom on large material and supply withdrawals only serves to pile up half the maintenance crew at the storeroom issue window every morning for at least an hour.

The daily schedule should be used for scheduling approximately 15 to 20% of the maintenance crew. This figure should be based on the percent of emergency breakdowns, plus a reasonable allowance for repairs resulting from preventive maintenance inspections which cannot be delayed for the weekly schedule.

When compiling the job orders for the daily schedule, the repairs resulting from the preventive maintenance inspections should be satisfied manpower-wise first. The remaining available manpower should be scheduled on salvage or fabrication of spare parts.

In case of an emergency breakdown, manpower should be obtained from the latter, since the stopping of this type work will not interfere with production. Once the emergency repair has been made, the people affected should be instructed to return to the work they were doing before the emergency occurred.

The written procedure should cover in detail, instructions going to: 1. The maintenance scheduler for preparing the schedule; 2. The operating department superintendents on method for putting work on this schedule; and 3. The maintenance superintendent on policy for conducting the daily scheduling meeting.

The Weekly Schedule

The weekly schedule should be the most effective vehicle in the control system for coordinating maintenance manpower and equipment repairs. If a plant is to realize the full effectiveness of this method of scheduling, absolute cooperation from the entire management team is a must.

Before the weekly schedule is ever introduced into the system, the maintenance controller should lay the groundwork through a series of meetings with operating and maintenance supervision. A sample schedule should be designed and prepared from actual job orders in the maintenance backlog file, for use in these meetings.

The maintenance controller should be able to sell this method of scheduling on its merits, some of which follow:

 The storeroom supervisor may use the advanced notice to schedule supply withdrawals,

2. Purchasing can use the extra time for expediting last minute needs.

 Operation can use the advanced notice for storing raw materials so that production is least affected.

4. Maintenance can use the extra time to prepare for the job, by: 1. Erecting necessary scaffolds; 2. Fabricating and fitting parts; 3. Delivering parts and supplies to the job site; and 4. Reviewing big jobs with the people who will do the work.

When this type planning and preparation takes place prior to shutting down production equipment, 50% of the normal production delay has been eliminated. The weekly schedule should be prepared and in the hands of the operating supervision by noon on Friday for the coming week.

The operating supervision should be instructed to notify the maintenance control department as far in advance as possible when it becomes apparent that a piece of equipment will not be available. The maintenance scheduler will simply use this manpower for the daily schedule during the time the cancelled job was

.. Planning Maintenance Work

scheduled. If the equipment can be made available later, the job will appear on the daily schedule.

The Shutdown Schedule

Scheduling shutdown repairs is an art. Compiling a long list of work orders, and scheduling every member of the maintenance crew 12 hours a day for 10 straight days is not good business. The greatest potential savings, both maintenance and production-wise, lies in the ability of the maintenance controller to handle the shutdown schedule efficiently.

The shutdown not only applies to the two big shutdowns most plants feel are necessary during a year, but to any shutdown of production equipment where repairs are involved. Actually, planning around these two major shutdown periods is not only possible, but is being done. When maintenance supervision fails to keep a plant in production without asking for one or more plant-wide shutdowns during the year, the equipment is calling the shots, and little form of control is evident.

When Is Shutdown Necessary?

The estimated manhours in the shutdown backlog is the best barometer for determining when a shutdown is necessary. These manhours should be compiled and reported by type work: ie, capital, regular maintenance, and shutdown; by trade: ie., millwrights, pipefitters, electricians, etc; by control center. ie., pulp mill, bleach plant, paper mill, etc.

The job orders should be filed in the maintenance schedule board by sections in control center, ie., No. 1 machine, No. 2 machine, etc. The maintenance scheduler should have the crew broken down into maximum available manhours by day.

Trade		ailable inpower	Available Manhours			
Millwrights		40	320			
Welders		10	80			
Electricians,	etc.	20	160			

When the estimated manhours approach the daily available manpower for the major repair trades for a machine, or section of a control center, the maintenance controller should contact the department superintendent and request a shutdown for a predetermined date. This date should be enough in advance, usually two to three weeks, to give the department superintendent time to schedule around the equipment, and the maintenance department time to get ready for the shutdown.

Preparing For a Shutdown

When the maintenance control department makes preparation for a shutdown, take the following steps:

 Secure from the department superintendent of the control center affected written job orders for any other work to be done on the shutdown.

Advertise the shutdown throughout the plant, stating the equipment affected, the day it will be down, and approximately for how long.

3. Set a deadline for accepting work requests.

4. Pull all shutdown work in the backlog for departments affected.

5. Sort all job orders to be considered for the shutdown by control center.

 Type, duplicate, and distribute to all operating department supervision, request an affirmation of each job order.

While awaiting the return of lists:
1. Pull all job orders requiring

advanced preparation.

2. Remove the job orders requiring

advanced preparation.

3. Schedule these jobs on a daily basis, making certain that all prep work is done before the actual shutdown, to include: a. Requisitioning of all equipment, parts, and supplies from the spare parts and stores warehouses, and delivery to the job site; b. Completion of all fabrications; c.

	PAGE	2	DAT	TE	HUDSON PLANNED SI	HUTDO	OWN SO	CHEDU	LE					
	TOADE	MILL	INJO RTS		DEPARTMENT #3 RECOVERY I. D. FAN	AINTENAN	ICE CALCON	SOR						
cost	ECIUN	EQUIPMENT JOS ORDER		CLASS	S DESCRIPTION OF VIOLES	JOS	ASSIST	DAY NIGH			TORT		MANAGED MANAGED	
MIES					10	TRADES	9 11		12/1		3 1	MO. OF TO		
					FIRST DAY CONTINUED					-				
11	FAN	209	4856	90	Connect hoist to wash water pump & remove.	BE	M.W. WELD			9			2	3
11	FAN	209	4856	90	Connect hoist to wash water pump motor & remove.	CE	M.W. WELD.			1			2	2
11	FAR	209	4856	90	Out old I. D. fan housing into sections. Lower to	E	M.W.		F				2	6
			8th. floor & remove.		METD		1/				1	2		
				P	WELD		1/1	+			1	6		
11	XXZ		4858	90	Remove sections of breeching from 8th. floor.	E	M.W.		N			+	2	14
11	FAN	209	4856	90	Connect hoist to I. D. fan rotor and remove.	2	M.W.		1				2	3
11	FAN	209	4856	90	Complete removal of I. D. fan housing.	F	M.W.			À	++	-	2	7
						G	METD	-	1/		#	\mp	1	10
					SECOND DAY				1					
11	XYZ		4858	90	Rig remaining section of discharge breeching, cut & remove intact.	A B	M.W.	+	#				2	10
11	XYZ		4858	90	Rig remaining section of inlet breeching, cut and remove.	B	M.W. WELD	#		A			2	10
11	XYZ	012	3881	90	Patch and repoir stack as becasely.	E	WELD			4	+	\exists	2	10
11	XXZ		4859	90	Prepare stack for new discharge breeching.	F	M.W. WELD		1	H	++	\perp	2	10

SHEET REMOVED FROM SHUTDOWN SCHEDULE

Erecting of scaffolds, rigging, etc.

 Re-estimate each job order for actual shutdown time, omitting prep work estimates.

As the lists of approved-work are returned, put them through the same process.

While the prep work is winding up, cause all job orders to be printed on a shutdown master, listing: a. Charge numbers; b. Job order number; c. A complete description of the work left for the shutdown; d. Trades necessary; and e. The estimated manhours for each trade.

Select the one big job which requires the greatest number of hours. This job should govern the length of the shutdown.

Total all estimated manhours by trade.

4. Divide the length of the shutdown in hours, as determined from the job of longest duration, into the estimated manhours for each trade (this process determines the estimated manpower required by trade to perform the work during the allotted time.

If the manpower available is exceeded, do not indicate working time for the jobs of lesser importance. However, do not remove them from the schedule, since some of the work scheduled will be over-estimated, and the jobs not scheduled may be used as fill-in work.

Sequence of Shutdown

When the shutdown schedule has been prepared, the maintenance controller, in a meeting with the department superintendents, should state the estimated length of the shutdown. The department superintendents should establish the day and hours to be allotted, and the shutdown sequence of the affected equipment.

This information is necessary to take full advantage of the available manpower, since it will be necessary for some pieces of equipment to go down prior to others. For example, in a paper mill, if the paper machine is the main objective, the sequence would be: 1. Wood preparation; 2. Digesters; 3. Washers; 4. Screens, etc.

The difference in the time between the shutdown of each section should be determined by the size storage areas and the speed of the paper machine in question. The start-up after shutdown would be in the same order.

Working from the shutdown sequence, the maintenance scheduler should indicate on the shutdown schedule the hours for working each job. The time of completion of the last job in each section should be the estimated start-up time of that sec-

tion.

The maintenance controller should prepare a cover sheet for the shutdown schedule, indicating the shutdown and start-up time of each section

The shutdown schedule should be duplicated and assembled, one copy for each interested supervisor. These schedules should be passed out and fully explained by the maintenance controller in a management meeting called for that purpose. Each department superintendent should have a thorough understanding of. 1. When maintenance will begin work in his department; 2. The equipment to be repaired; and 3. The approximate time when his section will be turned

over to him to start up.

The maintenance supervisors should thoroughly understand: 1. The work to be done; 2. The allotted time for doing the work; and 3. The deadline for completing said work.

Each member of the management team should understand: 1. The shutdown as scheduled is firm; and 2. No changes will be made without the approval of the manager of operations

Manpower handled in the above prescribed manner will mean effective manhours. Every man in the maintenance crew will be provided 8 hours work per day, and will be required to show through various means that he performed as expected.

Sales and Earnings – First Quarter 1960 Representative Pulp and Paper Companies

	Net Sales (000)	Income Bef. Taxes (000)	% of Sales	Net Income (000)	Net Per Share
MARKET PULP (Also Lumbe	er, etc.)				
Brown Co. (11/30)	\$ 18,080	n.a.		\$ 18	\$0.01
Georgia-Pacific Corp.	46,187	\$ 5,035	10.9%	3,575	0.63
Puget Sound Pulp & Timber Co	o. 9,701	2,552	26.3	1,225	0.47
Rayonier Inc.	34,133	4,634	13.6	2,644	0.47
Weyerhaeuser Co.	108,125	27,606	25.5	13,745	0.46
NORTHERN INTEGRATED	cos.				
Consol. Water Power & Paper	23,199	4,800	20.7	2,166	0.85
Diamond National Corp.	54,144	n.a.	-	2,842	0.60
Fibreboard Paper Prod.	26,080	n.a.	_	409	0.23
Glaftfelter Co., P. H.	6,710	1,357	20.2	611	0.84
Great Northern Paper Co.	13,678	1,239	9.1	709	0.68
Hammermill Paper Co.	15,655	1,471	9.4	775	0.61
Oxford Paper Co.	19,511	1,920	9.8	758	0.63
Warren Co., S. D.	19.463	2,632	13.5	1,237	0.57
INTEGRATED—NORTH & S	OUTH				
Container Corp.	76,459	9,463	12.4	4,643	0.43
Crown Zellerbach Corp.	132,204	n.a.	-	9,116	0.64
International Paper Co.	255,800	n.a.	_	18,276	1.36
Mead Corp.	77,061	5,850	7.6	2,818	0.55
Riegel Paper Corp.	19,810	1,558	7.9	725	0.52
St. Regis Paper Co.	121,997	10,827	8.9	5,952	0.60
Scott Paper Co.	80,213	13,877	17.3	6,677	0.83
Union Bag-Camp Paper Corp.	47,369	9,861	20.8	4,710	0.64
NON-INTEGRATED PAPER	COS.				
American Writing Paper Corp.	n.a.	325	_	156	0.58
CONVERTER					
Dennison Mfg. Co.	9,214	662	7.2	338	0.49
n.a.—Not Available.					

The sales and earnings for the first quarter of 1960 were especially prepared for PULP & PAPER by Cyrus J. Lawrence & Sons, members New York Stock Exchange, from statistical services and published reports. While the figures are believed to be correct no guaranty is given as to their accuracy.

Utilizing "The Other Half"

for new paper products, a basic-chemicals industry and increasing raw-product supply subject of Pacific TAPPI and CPPA Tech. Sect.

By LOUIS H. BLACKERBY Western Editor, PULP & PAPER

-Bellingham, Wash.

• Industry's "War on Waste" is paying off in better forestry, expanding wood utilization, higher pulp yields, and a broader product field.

These accomplishments were featured here in the extreme northwest corner of U.S. at the Pac. Northwest International Conference of Pulp & Paper Industry. This was a three-day joint meeting of Pacific Section TAPPI and Pacific Branch Technical Section, Canadian Pulp & Paper Assn.

Forest management people forsee increased per-acre wood yields from forest lands. Chemical producers predict extended use of mechanical pulp and production of more attractive and functional sheets through growing application of chemicals. Wood research authorities expect the quantity and types of by-product wood suitable for pulping to be exnanded. Still other means for stretching the natural resources supply and increasing production from per-unit of wood consumed are envisioned through the manufacturers of byproducts from pulp residues

In opening the international session, P. T. Dickie, tech. dir. of Crown Zellerbach Corp. West Linn (Ore.) Div. who presided as chairman of the TAPPI program, pointed out that "waste is our most important problem." This applies, he stated, in spite of the rapid advances made throughout the industry during recent yearsan era characterized by producing higher pulp quality from lower quality wood.

Growing Wood Supply

"The pulp industry has contributed greatly to improving utilization of this regions' forest resource," John B. Grantham, chief of forest utilization research, Pacific Northwest Forest & Range Experiment Station, Portland, Ore.

He pointed out that lumber and plywood production account for over 85% of the live sawtimber cut in the Pac. Northwest states. Almost wholly dependent on live sawtimber, these states use the bulk of the Douglas fir and ponderosa pine logs, and about half the true firs, hemlock and spruce.



Henderson

Garev

Redfern

Watson

Chidester

Grantham

WAR ON WASTE" SPEAKERS AT PACIFIC TAPPI SESSION: J. T. Henderson, project leader, Central Research Dept., Crown Zellerbach Corp., Camas, Wash., economic opportunities in pulping rejects; Carl Garey, res. forester, Weyerhaeuser Co., Monroe, Wash., practicing cellulose forestry; D. V. Redfern, vice pres.-gen. mgr., American-Marietta Co., Seattle, chemicals make high-yield pulps more attractive; Carter Watson, tech. dir., Puget Sound Pulp & Timber Co., Bellingham, chemical industry based on spent liquor is industry challenge; G. H. Chidester, chief, Pulp & Paper Div., U.S. Forest Products laboratory, Madison, Wis., investigating sawdust-shavings as chip potential; J. B. Grantham, chief Div. Forest Utilization Research, Pac. Northwest Forest & Range Experiment Station, Portland, pulp industry improving forest utilization.

The pulp industry has a competitive advantage in that it can use residues and does so to the extent of about half of its wood requirements. Since Douglas fir accounts for 62% of sawtimber cut in the region, and it provides an even larger share of the residues developed, it has a key role in pulp production.

Of the 1.7 million ton/year increase in pulp production between 1947 and 1957, two-thirds of the wood requirements was in the form of residues, according to Mr. Grantham.

Sawdust and shavings as potential sources of pulp wood-only slightly utilized to date-is receiving concerted study and consideration. Interested participants, in addition to the industry, includes the lumber producers, equipment manufacturers and research people. G. H. Chidester, chief of pulp & paper div., Forest Products Laboratory, Madison, Wis., reported that developmental work on saw designs shows promise of obtaining sawdusts of larger particles than are now produced, thus opening increased onortunities as a raw material suitable for producing pulp.

The laboratory has undertaken

studies on classifying sawdusts and

shavings from several sources. Commercial samples of various species produced by headsaws and edgers have been collected. Experimental sawdusts have been prepared with a headsaw using tooth bites ranging from 1/16 to 1/4 in. to ascertain the effect of this variable on particle size.

The fiber length of softwood sawdust obtained in sawing at a bite of ¼ in. per tooth "may range up to 90% of that of % in. standard pulp chips,' Mr. Chidester reported.

Advancing Forest Management

Thanks largely to the pulp and paper industry, the age of cellulose forestry has arrived." That's the way Carl Garey, mgr. of Weyerhaeuser Co's. Skykomish (Wash.) Tree Farm, expressed the impact of the industry's influence on forest management.

He says the development of integrated plantsites, where materials harvested from forests are concentrated, sorted and converted according to highest utility, have contributed materially to increased utilization of raw product wood. The conversion of wood into fiber has had startling effects on forest management activities-ranging all the way from formation of new terminology to major influences in logging methods.

New pulping processes utilizing hardwoods have extended the list of commercially acceptable species. According to Mr. Garey, this "process of broadening the species base has been of direct benefit to the woods manager who must handle these species in the harvesting operation whether commercially acceptable or not.'

Indicative of the significance industry attaches to better forest management, Weyerhaeuser foresters collected 193,000 bushels of tree cones this past season. That's 50 tons of seed worth approximately \$1 million, all dedicated to growing trees to meet future needs.

Rejects Make Good Pulp

Many reject pulps from screening operations are quite similar to highyield pulps and, consequently, point up utilization opportunities. These rejects, according to John T. Henderson, project leader, Central Research Dept., Crown Zellerbach Corp. Camas, contain "a great deal of partially cooked fibrous materials" and can be refined and cleaned. The resultant pulps resemble high-yield pulps which can be used in many grades of paper.

In defibering rejects and high-yield pulps, refiner operating conditions have been found to be determinant quality factors says Dr. Henderson. Improper defibering results in strength losses of up to 50 to 70%.

His department has refined groundwood rejects, in both lab and mill size refiners, to produce pulps superior to normal groundwood made in the respective mill concerned. The refined rejects were up to 10 to 25% in all strength properties over the regular groundwood.

Refining of sulfite knots and flatscreen rejects have produced results similar to those obtained from groundwood rejects. Refining of kraft rejects resulted in similar tendencies.

Dr. Henderson told the group the experiments have "merely scratched the surface in this area of defibering and refining high-yield and reject pulps. However, when a system is properly designed and operated it has been shown that good pulp can be produced for unbleached grades of paper.'

Regarding processing: The refiner must operate at close clearances and be sized to permit operation in this manner. Plate pattern is important and should be investigated as a function of each operation. The refined pulp contains some small fiber bundles and dirt. Centrifugal cleaners are required to remove this material.

More Products at Lower Cost

Resins will be substituted for fibrillation in the production of good paper. This possibility was predicted by Donald V. Redfern, vice pres.gen. mgr. of American-Marietta Co., Seattle. He anticipates that "mechanical paper per se will be manu-factured and used in high volume" and pointed out that agents promoting inter-fiber-binding are already making high-yield pulps more attractive. "Right now grades of paper otherwise unusable to the printer or package manufacturer can be made from high-yield pulps.

A corrollary of improved strength and greater yield from pulp sources, according to Mr. Redfern, lies in the use of chemical additives which maintain desired sheet properties at lower basis weights. By using resinous materials, at levels of around 1% in some cases, improvement in tensile and burst strength of up to 15-20% can be achieved. Fold endurance, strength and elasticity can be increased by other polymers.

Chemical aids can substitute for beating in developing strength properties, thus decreasing processing time and power expenditures. This can result in freer stocks, increased machine speed. Retention aids for increasing filler content and improving filler distribution facilitate production of printing papers of high opacity and brightness at low basic weights.

Non-Cellulosic Wood Materials

The economical utilization of "the other half of the tree" is the largest



Dickie Walseth

Smythe

Magnusson

HEADING PACIFIC SECTION TAPPI FOR COMING YEAR: Porter T. Dickie, Crown Zellerbach Corp. West Linn (Ore) div. was elected chairman replacing retiring Norval Magnusson, Puget Sound Pulp & Timber Co., Bellingham; Curt Walseth, Pulp-Paperboard Div., Weyerhaeuser Co., Cosmopolis, Wash. became vice chairman, Robert E. Smythe, of Ray Smythe Co., Portland, Ore, re-elected secy-treasurer.



PACIFIC COAST BRANCH, TECHNICAL SECTION, CPPA elects John H. Bardsley, B.C. Forest Products Ltd., Crofton, B.C., chairman succeeding J. H. Shumka, MacMillan, Bloedel & Powell River Ltd., Nanaimo, B.C.;

Ed. Barnes, Elk Falls Co. (Crown Z Can.), Campbell River, 1st vice chairman; John McLaughlin, Industrial Coatings, Vancouver, B.C. succeeds Robert R. Alpen, Robert R. Alpen Industrial Equipment Ltd., Vancouver, as secy-treasurer.

JOINT MEETING:- Pacific TAPPI and CPPA Tech. Sect.

challenge now confronting the industry, according to Carter A. Watson, tech. director of Puget Sound Pulp & Timber Co., Bellingham. "These non-cellulosic constituents amount to approximately 50% of the total wood and represent enough raw material to produce ten industries the size of the synthetic rubber industry."

Although heat and inorganic chemicals are recovered from spent liquors in the alkaline pulping process, this utilization does not have the profit potential that chemical utilization could offer. Mr. Watson said, "when one examines the value of some of the products that can be produced from spent liquor, it makes this source of heat and chemicals appear exorbitantly priced. Assigning a modest value to the chemical product results in a comparative heat cost of about ten times that from oil or gas."

Consequently it is "little wonder" that the alkaline pulping industry is

upgrading its chemical utilization of non-cellulosic portion of trees to include tall oil, turpentine, absorbent charcoals, and lignin products for dispersing agents, reinforcing rubber and extending resins. Dimethyl sulfide, now produced on a limited scale, holds promise of a bright future for silvachemicals from spent kraft liquors.

As to non-cellulosic materials from lignins and sugars from sulfite cooking of coniferous woods, these provide raw material for some practical, commercially accepted products. Examples include alcohol and torula yeast from sugars; binders from the crude spent liquor; and from the lignin have come products of various specialty uses based on their dispersing effect.

The tailoring of the refined lignin materials involves modifications of the lignin itself to develop desirable properties for specific applications. the plant's driver training program an approach which had the dual advantage of "selling" each driver on its values and incorporating pertinent, useful specifics.

Part of the success of the plant transport-handling program can be attributed to a sound preventive maintenance schedule involving regular servicing and periodic worksheets. When the records show high costs for unscheduled repairs for a vehicle, the causes are readily ascertained. Records kept on each lift truck are useful in objectively selecting units due for retirement and also indicate what should be specified in the line of replacement units.

The program has reduced the number of lift trucks needed at the plant by 50%—from 12 to 8.

W. J. Wood, admin. engr. of Rayonier Canada Ltd., Port Alice, B.C. disclosed how that plant overcame the problem of copepods in the water supply. Except for these small crustaceans, this mill's water supply system is almost ideal. The water is clear, in continuous and ample supply, and produces enough hydro-electric power to operate the pumps delivering it from the lake source over the summit enroute to the plant.

The copepods, which arrive at the mill in such quantities as to have previously caused considerable difficulty, are now removed by screening. Two 7,500 gpm. microstrainers installed at the plantsite do the job. Each of these units is equipped with a traveling self-cleaning 240-mesh stainless screen. They resemble deckers in appearance. The water enters through the open end of a rotating cylinder and flows out through the traveling screen.

Canadian Technical Section

Experience in adapting the Mead disc refiner to control tests on unbleached kraft pulp was reported by W. A. Mahoney, Alberni Pulp & Paper Div., MacMillan, Bloedel & Powell River Ltd., Port Alberni, B.C. The Mead unit was acquired with view to obtaining tackle which will pulp quickly and still give reproducible results. With it, the refining periods are confined to 9 min. maximum as compared to 40-70 min. for other equipment used here. Out-of-service time for sharpening is considerably less than for the other unit; mullen and tear are within standard limits.

Based on nearly 2 years of experience, Mr. Mahoney stated "the Mead refiner can be used with confidence as pulp evaluation equipment. For duplication of test results it is as good as, or better than, other types.' a 2-point control evaluation (at 300 c.c. C.S.F.) it requires approximately half the time as for evaluating one of the older beaters. Refining time to 300 c.c. C.S.F. increases at a constant rate but, within limits, the refining time does not affect the shape of the evaluation curves or the values obtained. Contrary to experience with specific beaters, he pointed out, slush pulp in this refiner develops at a slower rate than does machine-dried

The findings from studies of pulp made of longitudinally subdivided chips were reported by E. Elsermann, Columbia Cellulose Ltd., Prince Rupert, B.C. Pulp from normal chips were superior to that made from the modified chips. The project disclosed that the finer chips resulted in the highest yield and the pulp from subdivided chips has less alpha cellulose.

As to kraft pulp made from these chips, there's higher screened-pulp yield and pulp strength is about 13% below that produced from normal chips.

Successful Lift Truck Program

How a constructive in-plant handling program can reduce losses from product damage, increase output per transport vehicle and decrease handling costs was outlined by Joe Somer, divisional industrial engr., Crown Zellerbach Canada Ltd., Ocean Falls, B.C. Eight lift trucks, of 6,000-8,000 lb. capacity (each equipped with roll grabs), handle this port mill's entire output of around 150,000 tons per year. The product line includes newsprint, roto and specialty papers and pulp.

All the lift trucks are ruggedly built for the job. The roll grabs have pressure controls to facilitate applying pressure sufficient to handle the load unit without damage. As a means of applying proper pressure for various product items, charts were made up indicating the amount of grab pressure to be used for each.

Drivers participated in formulating

Improving Bleach Systems

The 500-ton bleached kraft pulp plant of British Columbia Forest Products Ltd., Crofton, B.C., which went into production early 1958, has an unusual automatic bleach preparation system. Some features were described at this meeting (See full report in this issue).

Wet End Additives

Wet-end additives offer wide opportunity in the papermaking field and still involve unknown limitations as far as the food additives amendment is concerned.

Panel consideration of wet-end additives pointed up the fact that these serve as formation aids, refining "tools"; improve sheet and internal bonding; improve printability and crush quality; add to stiffness, scuff







Elsermann



Somers



Wood



Jack



Fenwick

PARTICIPATING IN CPPA TECHNICAL SESSION. W. A. Mahoney, MacMillan, Bloedel & Powell River Ltd., Alberni Pulp-Paper Div., discussed Mead disc refiner; E. Elsermann, Columbia Cellulose Co. Ltd., Prince Rupert, reports on use of subdivided chips; Joe Somers, Crown Zellerbach Canada Ltd., Ocean Falls, tells of successful paper-handling program; W. J. Wood, Rayonier Canada

Ltd., Port Alice, cleaning mill water with microscreens; Walter Q. Jack, Hooker Chemical Corp., Tacoma, Wash., on continuous hypochlorite production at Crofton, B.C. kraft mill; T. L. Fenwick, kraft mill engr. at CZ's Elk Falls Co., Campbell River, B.C. wins MB&PR \$100 competitive technical award with report of study on effects of green liquor dregs recovery in kraft mill.

resistance and sheet strength. C. L. Ducharme, of General Mills Inc., Minneapolis, Minn., pointed out that additives producers are now working to include starch properties in gums, gum properties in starch. Frequently, he says, gum and starch cooked together produce results superior to either one alone and turn out to be the economical solution. When the two are used together they should be cooked in combination.

Discussing the "research direction" of wet-end additives, William Linke, American Cyanamid Co., Stamford, Conn., said the synthetic approach provides opportunities to build in desired properties. He sees big potentials for glue, sizing and polyacrylamide materials.

Representing the operational view of wet-end additives, Loyd McDonald, asst. paper mill supt., Longview Fibre Co., Longview, Wash., said tapioca starch is being used experimentally at his mill with good results. Addition of a small amount of gum has reduced starch losses and improved mullen.

Toxicology By Legislation

By act of congress the industry is now in the toxicology field and toxicity is becoming part of pulp-paper's terminology, according to J. T. Frawley, chief toxicologist of Hercules Powder Co., Wilmington, Del. He is convinced the industry could have avoided this situation if it had been more alert and reactive to the tendency toward spreading government control.

In that the Food & Drug Administration refuted industry's contention that paper-paperboard is not a food product and consequently exempt from the 1958 act, it is up to producers and/or users of additives to prove their safety and obtain approval of them. Hercules has undertaken a program costing \$500,000-\$750,000 to get its additive products approved.

Basics such as defoamers and slime control agents present significant problem factors to the industry. Users of wax emulsions may have to shift to higher grades of wax—a move engendering difficulties because of limited supply.

As to effects of the amendment R. C. Mispley, production mgr.-industrial paper grades, Crown Zellerbach Corp., San Francisco, stated it's probable that no other legislation has had such impact on the industry. The reaction of paper producers has been varied. Some can be expected to encounter trouble.

He emphasized that even the use of approved materials must be in accordance with the application for which approval was granted. Mineral oils, which can be purchased in any drug store for all sorts of uses (including internal consumption), are disallowed in paper.

Mr. Mispley advises the industry to "not be complacent" about getting the approval deadline extended beyond next March. There's but one way of obtaining another extension—that's by

passing another law.

The "cancer clause", ruling out all cancer-contributing additives, holds promise of a long struggle as far as industry is concerned. An obstacle mentioned by Mr. Mispley concerns the definition of "absolute zero" from the cancer-causing point of view.

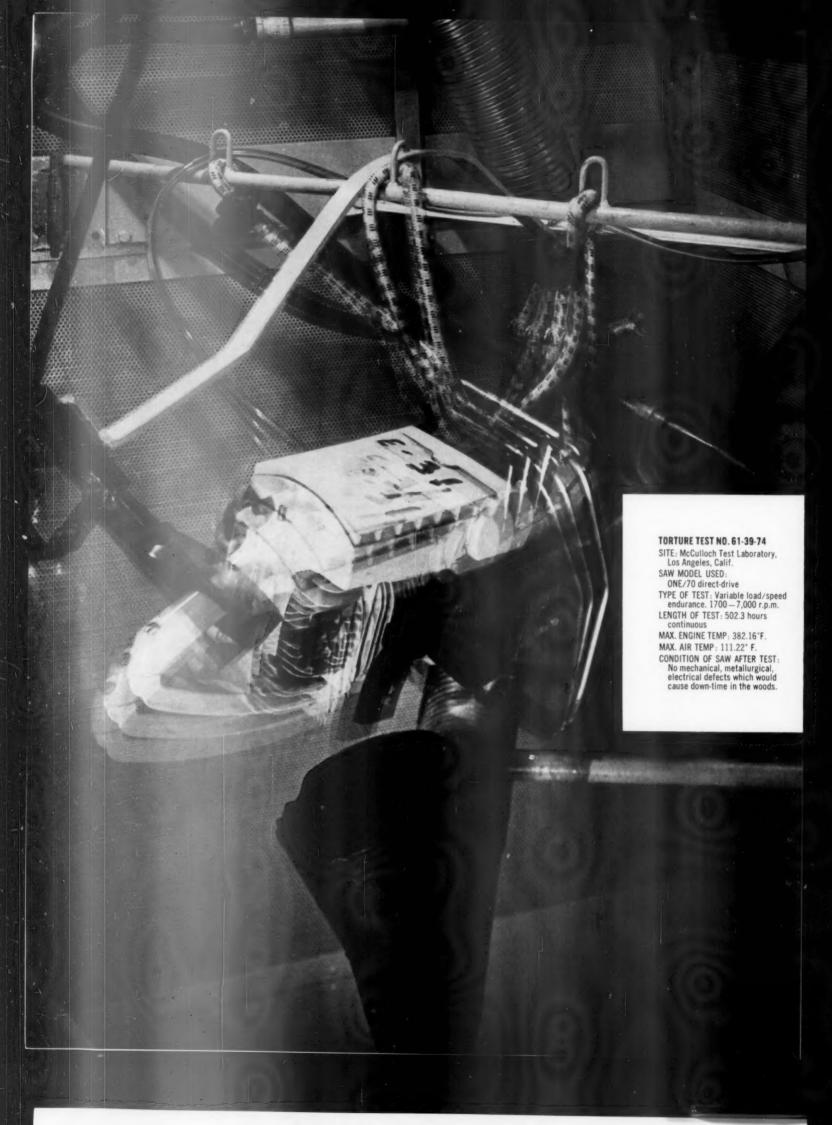


PANEL ON WET-END ADDITIVES: (l. to r.) R. C. Mispley, Crown Z, San Francisco; J. T. Frawley, Hercules Powder Co., Wilmington, Del.; Loyd McDonald, Longview Fibre Co., Longview, Wash.; William Linke, American Cyanamid, Stamford, Conn.; C. L. Ducharme, General Mills Inc., Minneapolis, Minn.; moderator C. W. Davidson, Crown Z Camas (Wash.) div.

Wausau Denies Rumors

Prompted by recent rumors of a forthcoming merger, David B. Smith, president of Wausau Paper Mills Co., Brokaw, Wis., has issued the following denial:

"Contrary to any rumors circulating in the paper trade, Wausau Paper Mills Co. is not being purchased by Standard Packaging Corp., nor are there any negotiations in process—by Standard Packaging or any other company."



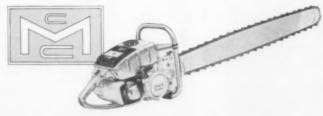
500 BRUTAL HOURS IN TORTURE CHAMBER PROVE STAMINA OF NEW McCULLOCH NUMBER ONE SAWS



A logging job takes rugged men and rugged chain saws. That's why the new McCulloch Number One chain saws were designed to be tough – built to be tough – proved tough by torture test.

The large picture at left shows a brutal endurance test. It's just one of hundreds of torture tests the new McCulloch saws had to pass. These torture tests prove that McCulloch Number One saws were built to take a beating and still stay on the job. Extensive field testing confirmed the lab torture tests. Hundreds of professional loggers and woodcutters throughout the country tested the new McCullochs on the job. Again, results proved that McCulloch makes the world's Number One chain saws.

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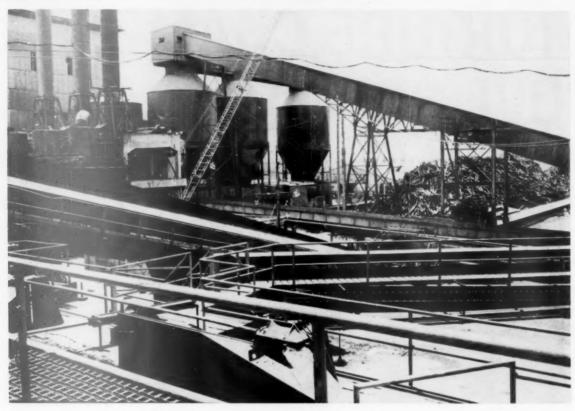
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VIEWED ACROSS SWEEPING WOODYARD, new Chicago Bridge steel silo stands beside older units. It will hold 300 cords of chips.

Union Bag Makes Way For Hardwood

Its woodyard was almost big enough to handle a \$35 million expansion but increased hardwood use called for changes

—Savannah, Ga.

Probably the least expansive but most significant changes in the entire "C" expansion program at Union Bag-Camp's Savannah, Ga., mill, the world's largest kraft operation, were in its woodyard.

Why significant? Because, as Resident Manager James R. Lientz, vice pres. of production, points out, practically all tonnage in this \$35 million expansion program is hardwood, As one of the South's pioneer and pro-

gressive kraft mills, Union Bag-Camp like many others, is beginning to recognize the need for greater hardwood use.

"About 25% of our lands are good only for growing hardwoods," says Mr. Lientz. "To stay in balance we had to expand our hardwood use."

Union Bag recognized this need as far back as 1956 when the "C" program was initiated. Like many others in the South, Union Bag-Camp is beginning to number the days that

hardwoods take a back seat to pine. This year, the Savannah mill will use 1,300,000 cords of pulpwood. Some 300,000 will be hardwoods and this percentage will increase.

\$22 Million Locally

Union Bag's heavy wood demands are met mostly in Georgia and South Carolina. Enough pulpwood comes into the mill every year to make a train stretching from Savannah to Memphis, Tenn. The trucks used in



UNION BAG'S SPRAWLING WOODYARD can be seen at left of mill in this aerial photo. Flumes can be seen cutting through the pulpwood aisles and truck handling facilities are in center. Almost a million-and-a-half cords of wood a year are handled in this woodyard.



EXISTING CONVEYORS and flume handle increase in wood demand although capacity was up 30% by addition of Peerless circulating pump.

its pulpwood operation actually number more than the total truck registration of some states. Each year, \$22 million goes into the pockets of surrounding farmers for purchased pulpwood.

Backing up this big wood appetite is an alert woodlands department recognized as one of the best in Dixie. Some of the important "breakthroughs" in pulpwood methods and harvesting are attributed to this company's progressive and aggressive woodlands staff.

Increase in Barking Facilities

Typical of the way in which changes were built around hardwoods was the increase in barking facilities. Four 12 ft. by 45 ft. Fibremaking Processes drums were added. Two of these were in the new pinewood handling facilities. The two others, which were added to existing facilities were split—one for pine the other for hardwood, So 25% of the increased barking facilities will be used for hardwoods, roughly the ratio which Union Bag would like to use in its pulping and papermaking.

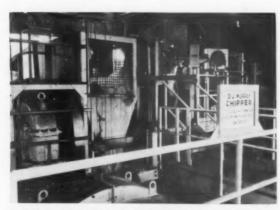
The existing flume system is large enough to handle the increased wood flow as is the conveying equipment carrying logs from the flume. A Peerless circulating pump was added, increasing the circulating capacity by about 30%. A Chain Belt screen for reclaiming bark was also added and a

grit collector was assembled from component parts.

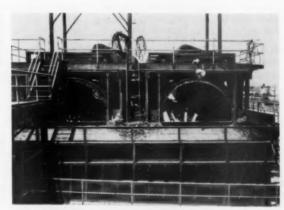
Included in the new pinewood system is a 110 in, Murco 10-knife V-spout D. J. Murray chipper powered by a 1,000 hp. synchronous General Electric motor. Chips are then screened over four 5 by 14 ft. double deck Tyler chip screens. Oversize chips are resized through a Jackson-ville Blow Pipe Eat Rite hog. A suspended magnet removes tramp iron.

Screened chips are stored in a third Chicago Bridge and Iron steel chip silo with 200 cord capacity. These are then delivered to the chip bins by Link Belt rotary plates.

Another article on Union Bag-Camp Corp., page 58.



PART OF NEW PINEWOOD SYSTEM was addition of big D. J. Murray 110 in. 10 knife chipper with V-spout. It is powered by a 1,000 hp. General Electric synchronous motor.



TO HANDLE ADDITIONAL WOOD NEEDS, four 12 x 45 ft. Fibre-making Processes barkers were added. These two are in the new pinewood system. Two others were in old systems.



POTENT WEAPON in combatting forest fires in British Columbia is this giant Mars flying boat, a unit in the four-plane fleet of newly-organized Forest Industries Flying Tankers Ltd.

Flying Tankers Set for Fire Season

. . . in British Columbia, where new firm has purchased Martin Mars flying boats capable of dumping 7,000 gals. of water on woods blazes.

• A group of major British Columbia pulp and paper companies will battle forest fires this summer with "Operation Deluge," using the world's biggest flying boats. The planes can scoop up 7,000 gal. of water in less than a minute and dump the load wherever required in a matter of seconds.

First of the giant aircraft to be employed by the newly-organized Forest Industries Flying Tankers Ltd. was commissioned in March, and it performed admirably, although its efficiency cannot be tested fully until the fire season begins during summer months.

Companies comprising FIFT include MacMillan, Bloedel & Powell River Ltd., British Columbia Forest Products Ltd. and Canadian Forest Products Ltd. Western Forest Industries (associated with Rayonier Canada Ltd.) and Tahsis Co. are also in the group. All have extensive timber holdings, sawmills and other wood-processing plants.

A Revolutionary Concept

To mount its offensive against forest fires FIFT has acquired a fleet of four Martin Mars flying boats, largest in the world and used originally by the U.S. Navy during World War II. Wing span is 200 ft., overall length 120 ft. 3 in. and height 14 ft. 7 in. Operating weight as water tankers is 170,000 lbs., fuel capacity 13,200 gals.

While bombing forest fires with water from the air has been carried out fairly extensively in various parts of the continent, the Mars flying boats are much bigger than any aircraft previously used and represent a revolutionary concept. Performance will be followed closely by industry, government and conservation agencies everywhere.

In the woods, an inch or two of rain is considered substantial rainfall. Fully loaded, the Flying Tankers can deliver almost 1/3 in. of water on an acre of ground with each unloading; and, depending on the distance from the source of water (such as river, lake or open sea, they can return with water loads at 10- or 20-min. intervals until the area is virtually saturated.

Headed for the Scrap Pile

The aircraft were purchased by FIFT from Mars Metal Corp., San Francisco. FIFT was organized as soon as it was learned the flying boats were available, with Leigh M. Stevenson, formerly a vice marshal of the Royal Canadian Air Force, as managing director.

In redesigning the craft for the new service it was decided to build one large tank with capacity of 5,000 gals. in the main cargo section near the center of gravity and two smaller tanks each with a capacity of 1,000 gals. The tanks were partitioned vertically fore and aft and transversely to give in effect four tanks of equal capacity. Each of these tanks was fitted with doors of approximately 3 x 4 ft. hinged at the top and carefully machined for water tightness. The doors are closed by a series of hydraulically-operated clamps closely set around the bottom and sides.

The only place to install the scoops was at the rear tanks—one on each side midway between the keel and the chine. The scoops are hydraulically operated and are installed in a watertight well. The water, picked up from the sea or lake surface, is piped into the rear tanks and flows through a series of valved ports into the front tanks. The scoops are 6% in. in dia.

NEAR ROGUE RIVER, OREGON



D7D SKIDS ON GRADES UP TO 50%

The Cat D7 Series D Tractor has more power than ever. Its big 140 HP turbocharged D339 engine delivers 80% more lugging ability, pays off big on jobs like Elmer Milton's contract logging operations near Rogue River, Oregon. In this rough country—with grades up to 50%—the D7 skids 35,000 feet per day over haul distances up to ¼ mile with an average load of 3500 bd. ft. "The increased power enables the D7 to produce as much as a lot of bigger tractors I've seen," observes Mr. Milton. And here's what operator Harold Austin says about the D7D: "I can work in the next higher gear than on the previous model and still it's easy to skid big logs in rough terrain."

Matching the increased power is increased fuel economy. The turbocharger uses exhaust gas to pack added air into the cylinders, helps the engine convert fuel into higher, more efficient power.

The D7D has high ground clearance to move fast and easily over rough terrain. It's stable for safe working on steep slopes. And it's packed with improvements that reduce maintenance costs, prolong life. A dry-type air cleaner traps at least 99.8% of the wear-causing dust in intake air, yet it is serviced in just five minutes and eliminates the cost of oil. Lifetime lubricated track rollers with patented floating ring seals never need attention. Stronger power train components transmit the added power with ease and the transmission is now pressure lubricated for even longer life. And remember, only the D7—in its class—can offer the exclusive oil clutch that gives up to 2000 hours of adjustment-free service!

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CATERPILLAR

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PULP & PAPER

Pulpwood Section

and have a travel of about 16 in. from the "up" to the "down" position.

A valved vent at the top of the tanks allows air to escape while the tanks are filling and closes when the tank is full. The closing action operates a light on the pilot's panel. When the tank is full, and until the scoops are retracted, spring-loaded doors on the sides of the tanks allow excess water to escape.

Pushbutton Control

The controls that operate the scoop equipment consist of one simple switch, which in its forward position sends the scoops down and in its rear position retracts them. A small switch-board on the pilot's panel provides one switch for each tank to open and close the doors. These operate as selector switches so that the pilot can choose the individual tanks to be opened or closed. When the pilot is ready to drop water, a master switch is thrown that allows the selected

tanks to operate simultaneously. The size of the switchboard and the number of switches give no indication of the mass of engineering that has been required in this installation.

In March, the first converted Mars was put into the water and given its preliminary tests for certification of airworthiness by the Department of Transport, Ottawa. A total of 6,000 gals. of water was picked up in 50 secs. and dropped in 4 secs. During subsequent tests it was found that adjustments had to be made in both equipment and technique. Changes were necessary in the door-closing device, and a system was installed to bring the doors down to a clamping position. A weak section was incorporated in the scoops to allow them to break off if they hit an obstruction, rather than injure the hull. The scoops still had to be strong enough to meet a stream of water traveling at 75 mph and fill the tanks at a rate of 7,000 Subsequent tests demonstrated that the tanker would fulfill expectations. "It seems to work very well," Mr. Stevenson told PULP & PAPER. "It has done just about everything required of it, although the final test will be when the aircraft is sent on its mission to battle a fire. We're very hopeful that it will be a success."

Dispatcher in Vancouver

When fully developed and tested, the flying boats will be based at Sproat Lake, a centrally-located area commanding a wide stretch of forest on Vancouver Is., a few miles north of Port Alberni. A fire dispatcher, located in Vancouver, will receive calls for the plane from member companies. For this office Douglas B. Taylor, formerly district forester for the B.C. Forest Service at Vancouver, has been appointed. On receiving reports of fire he will immediately instruct the tanker's pilot to proceed, giving him the position of the fire and all available details, and he will remain in radio contact with the pilot throughout the flight. Communication between pilot and ground party at fire will be by two-way radio.

Small Operator Important Cog In Fire-Weather Forecasting

Opportunities yet exist for more effective fire-weather forecasting. This essential segment of forest protection armament has improved considerably during the past few years—both as to the adequacy of fire-weather forecast information itself and its utilization. In spite of this progress, there's still room for significant improvement.

Fire-weather forecasting is actually a low-cost operation when compared to tremendous expenditures for overall forest protection, according to George S. Schroeder, chief forester of Crown Zellerbach Corp. He was speaking to forest management personnel assembled at Western Forestry & Conservation Assn's, recent 50th anniversary meeting.

As pointed out by Mr. Schroeder, high forest protection costs pay off. "When one considers that logs from a single peeler type Douglas fir may be worth \$1,000; that a slight mistake in slash burning may kill a great deal of value in stumpage at the top end of a clear-cut setting; that it's possible to spend \$100,000 per day in controlling a bad fire situation—when these are considered, careful weather sampling and accurate weather forecasting makes a good deal of sense."

It appears, he pointed out, that the small operator is the one that's not being properly serviced at present. Therefore, it's logical that, "we should find a breakdown in our fireweather forecasting in the area of the small forest operator. The answer may be found either in more careful tailoring of the state forecasts for his use or in making available specific forecast to such small producers by the larger private corporations. In the case of Crown Zellerbach, making forecasts as a result of careful intensive study, benefits can be just as real to a small operator in any one of the CZ tree farm areas as it is to the CZ superintendent in charge. There is no reason why such an operator should not have a receiver on the CZ radio frequency in order to avail himself of those forecasts as they come in at 5:30 in the morning.

"It also may be that the state forestry departments could very easily justify an early-morning forecast in order that the small operators might benefit therefrom."

With view to lending to the effectiveness of low-cost fire-weather fore-casting, Mr. Schroeder urged keeping it as accurate, timely and helpful to the intended audience as possible.

There's also possibility, "that our dovetailing of federal, state, association and private fire-weather fore-casting has not been carried out to the point where we are receiving the greatest benefits for our expenditures. If there is any way that our work can be modified to lower costs and increase efficiency, then certainly a survey that will point out these possibilities will more than pay for the cost of making it."

Neoprene Hose Gives Long Service at Potlatch

After service life 16 times that of ordinary hose, 600 feet of neoprene fire hose is still going strong in the rugged chemical environment around the Potlatch Forests Inc., kraft pulp and paper mill in Lewiston, Idaho, according to C. O. Bing, Potlatch fire chief.

Conditions under which it is stored and used are "as tough as there are anywhere," Mr. Bing says. The area where the hose is used contains lime rock, salt cake, acids, and black liquor. The ground itself is gravelly, and crisscrossed by railroad tracks.

"Petrochem" hose of neoprene jacketed with "Dacron" polyester fiber, is made by Thermoid Division, H. K. Porter Co., Inc., Philadelphia., Pa. Du Pont Co. makes neoprene and "Dacron"

Now Operates 95% on Waste Wood

Lebanon plant ships logs from cold deck to other CZ mills

Crown Zellerbach Corp's pulp-paper plant at Lebanon, Ore. now operates almost entirely on waste wood. Although this represents an exceptionally high utilization as far as raw product materials are concerned, the mill has been in the high utilization "league" from its inception 69 years ago.

At the beginning this plant produced paper from straw left-overs, by-products of this agricultural community. During the early 1900's a log pond replaced the waning strawstacks here as the mill changed over to logs of "weed species" (white fir, hemlock)

for its raw-material.

During the past decade the plant's reliance on long logs gradually declined and purchases of chips, made from lumber and veneer residues, increased. With the recent completion of new chip handling and storage facilities, production was again-based on the utilization of wastes—industrial left-overs rather than agricultural wastes as in the beginning.

Fiber Requirements

About 85% of the fiber requirements for this 80-ton sulfite mill consists of chips brought in by rail or truck from a 3-county area. Delivered chips are transported via pneumatic conveyor system to the plant's 80,000 sq. ft. outside storage area adjacent to the mill.

Another 10% of the raw-product supply is obtained as bark-free hemlock slabs from small sawmills which are not equipped to convert them into pulp chips. The balance of the plant's raw product wood consists of alder and cottonwood logs obtained from local tree farmers. Chipping of the slabs and logs is carried on at the plant.

With complete discontinuance of using long logs, the Lebanon division was confronted by a unique pulp-mill problem—loading logs from the plant's cold deck into railears for shipment to other CZ mills. Many of these logs were hemlock sinkers recovered from the bottom of coastal lakes by a salvage operation completed several months ago.



LOADING HEMLOCK LOGS from storage decks at Crown Z's Lebanon, Ore. plant into railcars for shipments to firm's other mills. Use of these logs was discontinued at Lebanon in favor of high utilization of lumber-veneer residuals and hardwoods.



WOOD NOW ARRIVES as chips (above) and hardwood logs (below) harvested from local farm woodlots.



Chip Unloading Rate Up With Front-End Wheel Units

 Sawmill chip unloading has been speeded up 30% at the Springhill, La. mill of International Paper Co., says H. M. Reed, Jr., plant engineer. Increased man-hour output, he says, results from use of front-end wheel loaders.

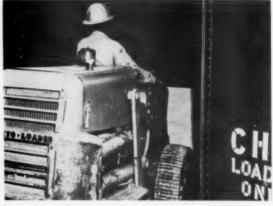
Chips are delivered in box cars on a seven-day week basis. About 250 cords are unloaded daily.

The unloading dock along which the cars are sided is equipped with a hopper. Wheel loaders scoop up the chips, turn in confined quarters and dump directly into the hopper, from where a conveyor belt leads to the woodroom.

According to Mr. Reed Allis-Chalmers TractoLoaders (Model TL-6) are used in the operation "in order to speed up close-quarter material handling."



 MOVING IN CLOSE, unit dumps its ¾-yd. bucket into hopper on loading dock at International Paper mill. Conveyor carries chips to woodroom.



1. CROWDING CHIP PILE IN BOXCAR as bucket tips back 22 degrees to pick up load. At Springhill, Tracto-Loaders operate with minimum downtime.



3. DIRECT UNLOADING FROM CAR TO HOPPER is possible when car has been sufficiently emptied. Allis-Chalmers loaders have a 6½-ft. turning radius.

New Pulpwood Measurement Technique Stresses Actual Fiber Content

• Selling pulpwood by the cord may soon go the way of Paul Bunyan and the hand-operated crosscut saw. In its place will come a measurement system based on "fixed average density."

According to the men responsible for its development—James Benson and Walter Wallin, foresters at the University of Minnesota, the method "gives a close estimate of the amount of dry fiber in a load of wood—just what a paper company needs to know."

One result could be a better pricing system for the man selling wood. If the technique proves successful, it will be available to the entire pulp industry.

The Minnesota foresters explain:
"... A cord varies in actual volume.
... In practice, most cords vary from about 80 to 110 actual cubic feet, nobody ever knows just what the accurate figure is. A few years ago it was found that weight was better than cord measure for green wood. But with wood partly dried, fiber was still difficult to estimate." A check on moisture content requires too much time to be economically feasible.

Forester Benson and Wallin checked aspen from a variety of sources to determine the average amount of fiber in a ton of green wood. This is the "fixed average density" and is the basis of the measure.

At delivery at the mill, from one to six sample pulpwood sticks are dropped into a tank of water mounted on a scale. The weight of the stick is noted. The stick is then completely immersed; and from the weight of the displaced water, the number of cubic feet of dry wood can be determined.

From the volume, weight and "fixed average density," the percentage of actual fiber can be calculated. If this is 40%, for example, and the total load is 8,000 lb., the seller would be paid for 3,200 lb. dry fiber.

One paper company is already testing the system on woods other than aspen—such as spruce and balsam. It will also be tested for logs and other products.

Microwaves In Forest Industries

By DON A. SWAN, Forest Engineer, American Pulpwood Assn.

• Generally speaking, microwave systems are cheaper than high grade land lines, mile for mile. Probably the first application of microwave will be use of its more simple telephone functions. With your own microwave system you will simply dial any phone in the system just as you do your reg-ular telephones. The same channel will act as a signalling and dialing channel so that you may select any telephone in your system. Quality of voice transmission will be far superior to F.M. radio circuits that we now have and you will not have to use the 'over and out" routine as in radio but can cut in at any time that you can shout the other fellow. Contact with mobile stations will be accomplished by dialing the mobile unit directly over the microwave system which can be made to ring a bell or start other signalling devices.

What is Microwave?

Basically, microwave is a very high speed method of massive communications using radio beams in the spectrum above 890 megacycles. Comprehension of the tremendous speed is hard to grasp. Six thousand megacycles is a common microwave quency. One megacycle is one million cycles; thus we are talking about six billion cycles, then we introduce the element of time and find that it all happened in one second. Technicians have been able to take that second apart and impress information on each of the six billion intervals. By grouping these intervals so multiple users can each use a little bit of that see ond, multiple transmission of intelligence over one common radio beam is achieved. It is probable that thousands of two-way telephone conversations on a simultaneous basis over one microwave beam are today being accomplished.

We might think that microwave would not be reliable, but it is one of the most reliable means of communication. That is why the telephone companies in appeals to the Federal Communications Commission have desperately tried to retain all micro-

wave channels for their own use. To date they have not been successful due to efforts of the Forest Industries Radio Communications (FIRC) and other private radio associations.

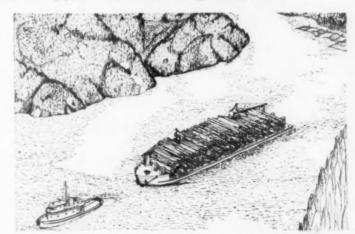
Microwave beams travel on a line of sight basis and are generally relayed every 25 to 30 miles.

Teletype Circuits

Another function that microwave performs well is carrying teletype circuits and you can put practically an unlimited number of teletypes over the same system as 25 separate teletype circuits can be put over one voice circuit.

The next step may well be punching business machine cards by microwave and microwave will do it and automatically check and doublecheck the data instantaneously while it is transmitting the basic data. One possibility: transmission of payroll scale data from wood to a central office (See IBM Scale Recording, PULP & PAPER, Sept. 1959, pages 141-142). Microwave makes an excellent telemetry circuit carrier. In Washington State, a private power company is regulating generating facilities at a remote dam through closed circuit television and telemetry both over the same microwave system.

New Type All-Steel Log Carrier



This new type of all-steel log carrier being built on the West Coast for British Columbia Forest Products Ltd. is the self-dumping type. It departs from conventional barges now in use by MacMillan, Bloedel & Powell River Ltd., Crown Zellerbach Canada Ltd. and other companies to meet specific requirements peculiar to BCFP.

The vessel, under construction at Yarrows Ltd., Esquimalt, B.C., is 305 ft. long, has a 60-ft. beam and 12-ft. draft when fully loaded with 1,000,000 ft. of logs. Tipping tanks are fitted into one side and are controlable individually and collectively. They can be filled within 20 min. while under load and are self-bailing after load is discharged.

Two 65-ton Lorain cranes, fitted with special Young log grapples, are used for loading and, when necessary, for unloading.

Loading can be carried out whenever logs are located. Savings in tug and barge time, as well as time required to tow logs to stationary loading-out works, is the objective.

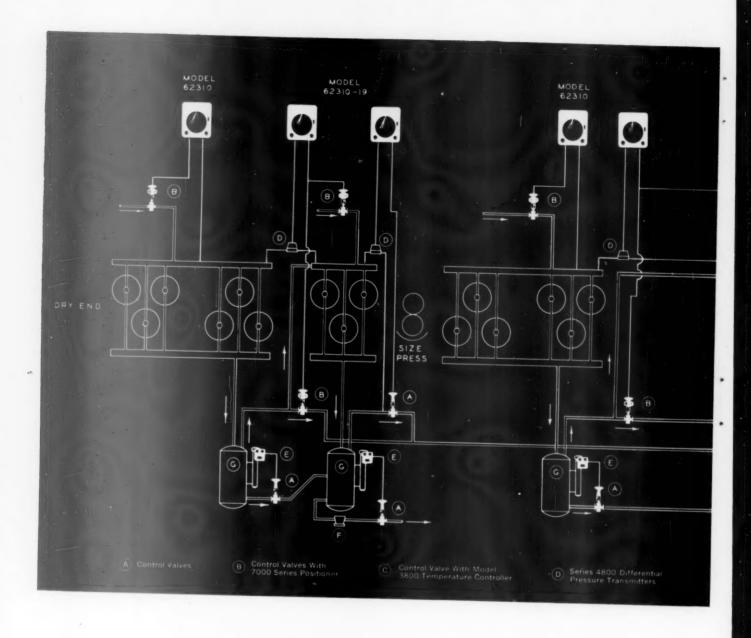
Barge will be accompanied by a 20-ft. towboat used in servicing the barge both at loading and unloading operations. By use of quick-locking fasteners and one of the cranes, boat can be loaded or unloaded and put to work in minutes.

Another result the company hopes to achieve is reduction in time during which logs are in the water. Logs left floating become subject to attack by ambroasia beetles and teredos and sometimes tend to sink.

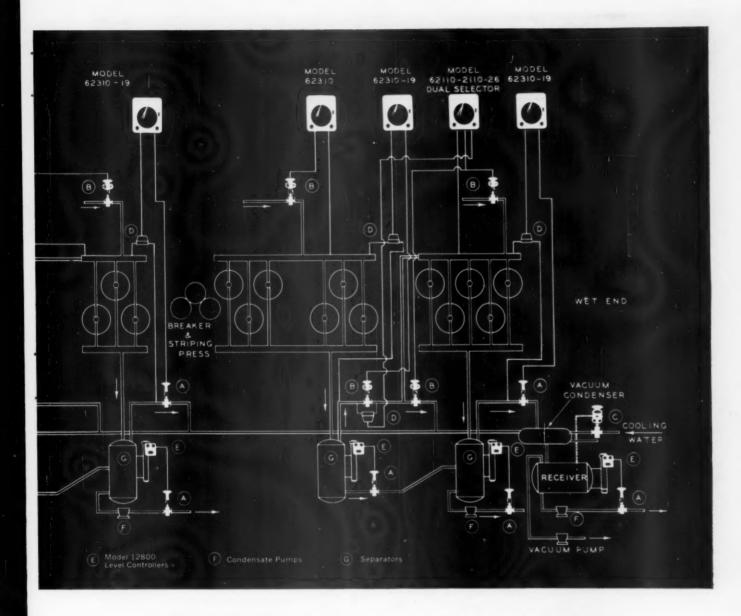
Chesapeake Expands Pulpwood Fleet

Two converted LSMs have been added to the marine fleet of Chesapeake Corp. of Virginia. The pulpwood carriers were purchased from the federal government.

^oMr. Swan prepared this report based on a paper by Robert W. Olin, director of planning, Potlatch Forests, Inc. Technical aspects were checked by Elmer Surdam, manager, F.I.R.C.



Quality + Efficiency in Papermaking



... with MASONEILAN Drying and Drainage Systems

An essential element in the production of quality papers is proper drying — obtainable only through accurately controlled steam, efficiently applied to driers.

Masoneilan Drying and Drainage Systems are individually engineered for each paper machine to provide accurate control of steam pressure to the driers and continuous evacuation of condensate, air and non-condensables from all driers, through means of closely controlled differential pressures. This insures improved paper quality, reduced tonnage losses, maximum drying efficiency, and increased machine speed and flexibility.

These systems are available for Single and Multiple Section Paper Machines and for Yankee Driers, including Warm-up Control and Automatic Surface Temperature Control. Mason-Neilan engineers the systems and furnishes all equipment and controls — one source and undivided responsibility — for both new and rebuilt machines.

Send for Bulletin PD 113 . . .

for descriptions of basic Masoneilan Control Systems and related equipment; and for cooperation in engineering, contact a Masoneilan representative or write direct.

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Strictly Personal

Northeast

Dr. W. Allen Schenck is named mgr. of New Jersey operations in the Specialty Products div., Riegel Paper Corp. John H. Rich, divisional mgr. of converting and coating, is advanced to mgr., special projects and is succeeded by John H. Steinbinder, former converting supt. . . . Edward B. Vaughan is appointed senior vice pres. of Bulkley Dunton Pulp Co. Inc., New York, N. Y.; he was vice pres. . . . Howard N. Atwood Jr. becomes mgr. of International Paper Co.'s milk container plant now under construction at Framingham, Mass.; he was the division's sales representative. Plant supt. at Framingham is Raymond E. Cihak.

Benjamin C. Baldwin is appointed director of market research for John W. Bolton & Sons Inc. and the Emerson Mfg. Co. div.; he held a similar position with Simonds Saw & Steel Co., Fitchburg, Mass. . . . The Eastern Fine Paper & Pulp div., Standard Packaging Corp., names Emerson Lewis staff asst. to the division mgr.; he was Eastern's mgr. of materials handling.

Wilson W. Cross becomes product mgr. in the Specialty Products div., Riegel Paper Corp. Reporting to Mr. Cross as product mgr. for merchant and technical papers is John B. Nunez. . . . Charles B. Stauffacher, exec. vice pres. in charge of the Robert Gair Paper Products Group, has been elected to the board of directors of Continental Can Co.



Philip L. Hovey Named to Oxford Paper Co. Board

He is vice pres., manufacturing, and has been with the firm since 1939, when he was graduated from Yale Univ. with a B.S. degree in industrial administration. From 1941 to 1948 he was in the sales dept. in New York, later returning to the manufacturing dept. After serving as mill mgr. at the W. Carrollton, Ohio plant, he became asst. vice pres., manufacturing, and in 1957 was named to his present post.

Otto W. Hein, vice pres. of Black-Clawson Co., has completed 40 years' service with the firm; he is on the corporate staff and charged with coordination of all production facilities and capital investments. . . . Edward J. McMahon is named director of industrial relations, St. Regis Paper Co.; he was director of labor relations

Charles K. Brett becomes mgr. of market development for folding cartons in the Boxboard & Folding Carton div., Continental Can Co.; he was asst. mgr. . . . New York & Pennsylvania Co. Inc. reports reorganization of its Traffic dept.: Harold E. Duffy, traffic mgr., is now gen. traffic mgr.; Allan R. Wycoff, traffic mgr., rates; William M. Kicher, traffic mgr. mill service, and Roger A. Yaple, special asst. to the gen. traffic mgr.

The Eastern Chemical div., Hooker Chemical Corp., names John M. Glaze supervisor, organic chemicals, and Robert W. Roach to succeed Mr. Glaze as a field salesman in the New York district. , . Roy S. Fisher is appointed administrative vice pres., National Vulcanized Fibre Co.; he continues as sales vice pres.

Patrick J. Reilly becomes director of labor relations for Brown Co., Berlin, N. H.; Mr. Reilly, who replaces Alfred B. Clark, was Midwest labor relations representative for St. Regis Paper Co. Donald E. Mavo, field engineer, is named Northeastern engineering and service mgr. for Manchester Machine Co., Middletown. Ohio.

Fred H. Pinkerton becomes senior vice pres. Reinhold-Gould Inc. and is succeeded as vice pres., and sales mgr. by Nathan Cooper.

J. C. Barthel is made gen. mgr. of the Research & Development dept, in the Bondware div. of Continental Can Co.: he was technical director of the Paper Chemicals dept., American Cyanamid Co. . . . William M. Riegel is mgr. of merchant and industrial sales in the Specialty Products div., Riegel Paper Corp.; he was eastern sales mgr. for packaging materials. . . . Irving Fischer, asst. district supervisor of the National Adhesives div., is now also New York district sales mgr., National Starch & Chemical Corp.

Robert R. Horwarth is elected president of Columbia Box Board Mills Inc., Chatham, N. Y.: he has been with the firm since 1945 and has served as exec. vice pres, since 1954. He succeeds his late father, Charles W. Horwarth. New exec. vice pres. is Arthur J. Dimick, former sales mgr. . . . Sidney J. Whelen, 73, for many years a top salesman for Shuler & Benninghofen, Hamilton, Ohio, died recently at Norwood; he covered Pennsylvania, New Jersey, Virginia.



International Paper Names Savage to Board

F. Henry Savage, marketing vice pres., and has served as gen. sales mgr. since tors. He joined the company more than 35 years ago and for many years was sales mgr. of the Book & Bond div. Mr. Savage was elected a vice pres. in 1951 and has served as gen, sales mgr. since 1954. Earlier this year he was named to his present post.







Rand

International Paper Co. V.P.'s

Wallace K. Graves, George H. Rand and John L. Tower are new vice presidents announces Richard C. Doane, president of I.P. Edward Z. King, Jr., who has been an assistant treasurer, assumes the new corporate office of comptroller and John S. Maxwell is named assistant treasurer.

Mr. Graves, who will serve as vice president in charge of sales of primary grades of paper and paperboard, joined IP's Fine Paper Division in 1930.

Mr. Rand, whose appointment as manager of manufacturing of the company's Northern Division was announced last January, will continue to serve in that capacity. He joined the company in 1930 at the Otis mill as an apprentice.

Mr. Tower joined International Paper in 1950 as director of public relations. He will continue in this capacity and in addition direct IP's advertising and sales promotion departments.



New Type AVR static-powered adjustable-speed drive

With the new Westinghouse static-powered AVR adjustable-speed drive, maintenance costs are virtually a thing of the past. Power magnetic amplifiers replace the conventional motor-generator set . . . there are no moving parts to weaken from wear and fail . . . you enjoy all the proven benefits of static control components.

Providing smooth, stepless speed control, new AVR drives are designed for use with motors from 1 to 200 hp... give you constant torque over an 8 to 1 speed range, or 10 to 1 with modification... are also available with constant-horsepower speed ranges.

New Westinghouse AVR drives are completely engineered, assembled and factory tested. They provide higher operating efficiency with greater reliability than heretofore obtainable from conventional drives. They simplify installation and reduce floor space required...sometimes as much as one-half the area of conventional M-G set drives.

Ask your Westinghouse sales engineer to show you exactly where and how you can benefit from new Westinghouse adjustable-speed drives. Or, write Westinghouse Electric Corporation, P.O. Box 868, Pittsburgh 30, Pennsylvania.

Also available . . . the new, redesigned motorgenerator Type AV drive with new siliconeinsulated Life-Line® "H" d-c motor, new electronic regulators which simplify maintenance, and positive-pressure ventilation for longer, trouble-free life.



TUNE IN WESTINGHOUSE-CBS TV-RADIO COVERAGE, PRESIDENTIAL CONVENTIONS, JULY 10-29



PULP & PAPER

Strictly Personal

James C. McCormick, sec.-treas. of Knowlton Bros., Watertown, N. Y. specialty paper manufacturers, has celebrated his 70th anniversary with the company. He is 89. Mr. McCormick joined the firm in 1890 as a clerk stenographer. . . Dr. Lawrence R. Scharfstein, a former Westinghouse Electric Corp. engineer, has been named supervisor of corrosion research, Carpenter Steel Co. . . Thomas E. Davy becomes mgr. of the Filtration div., Nicholas Engineering &

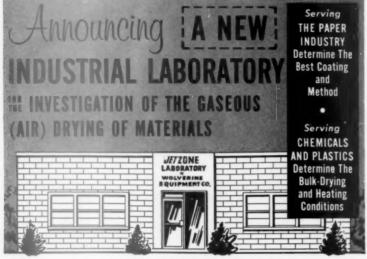
Research Corp.; he was sec. and mgr., Customer Service dept., Komline-Sanderson Engineering Corp.

Sherman F. Jenkins Sr., asst. supt., Howard Paper Co. div., Howard Paper Mills Inc., is named division safety supervisor; he joined the firm in 1917. . . . Floyd L. Coons is Midwest sales representative for Morey Paper Mill Supply Co., Fitchburg, Mass.; with a 10-year background in papermaking, he was formerly with Eastwood-Neally Corp.



Alvin C. McCully, Northeast Sales Engineer for Langston

Samuel M. Langston Co., Camden, N.J., manufacturers of corrugated container machinery and slitters and winders, announces Mr. McCully has moved to RFD Route 7, South Shaftsbury, Vermont, suburb of Bennington, from the Camden, N.J., office to better serve the industries in the Northeast. He will have major responsibility for all of New England, eastern Canada and most of New York State. McCully's telephone number is Arlington, Vt., DRake 5-6674. When he is absent, a recording device will answer.



Three Pilot Lines

A Universal 3-Zone Conveyerized Oven — Interchangeable air projection plates above and below — Temperature 70-600° — Low and high velocity 400-10,000 ft. per min. — 24" wide conveyor with wide range drive — All zones individually retractable from conveyor line — Steam injection for humidity control all zones — Zoned horizontally as well as vertically.

Purpose: Drying and curing of wet material — Coated webs, coated objects, plastics, impregnated webs, etc. — Arranged for quick determinations on all products by the "Miniaturized" sample car method.

Preceded by: Coater, impregnating tanks and squeeze rolls.

Two Zone Dryer, Heater or Cooler for Particulate Matter (pelletized material—chopped material—crystals). Works by aerating a bed of material on belt conveyor—Velocity range 1000-10,000 ft. per min.—Temperature 45°-600°—Arranged for separation of fines—12" wide belt conveyor.

Purpose: Drying, heating, cooling of particles of material.

Preceded by: Feeder or pelletizer.

LINE 3 Super Speed High Velocity 4-Zone Arch Dryer for Coated Web Material — Carries 24" web on rolls or belt — Velocity 400-12,000 ft. per min. — Temperature 70-600°F — Proved drying capacity (clay latex) 2800 ft. per min.

Purpose: Proving coatings and coating methods.

Preceded by: Coaters by different manufacturers.

Plus — Precision Batch Dryer — Basis Weight Scales, Thermocouples,
Thermometer, Mixing Equipment, Etc.

Write for terms and advance reservation, Please include description of product and scope of investigation required. Clients are not expected to be customers of our other divisions. Reports and samples are the exclusive property of the client.



JETZONE LABORATORY DIV.

A LEADER IN HIGH VELOCITY DRYING SINCE 1946







DeVitt

Franzen

Leslie Jr.

Hammermill Advances Four in Executive Positions

John H. DeVitt becomes exec. vice pres., John E. Franzen marketing vice pres. and Donald S. Leslie Jr. treasurer.

Mr. DeVitt joined Hammermill in 1922 in the finishing room, entered the accounting dept. in 1926, became asst. auditor in 1932, director of the budget in 1941, controller in 1944, asst. treas. in 1948 and treas. in 1953. Mr. DeVitt joined the board in 1956 and since February 1958 has served as asst. gen. mgr. Mr. Franzen became associated with Hammermill in 1946 as mgr. of the New York sales office and asst. district sales mgr. of the eastern territory. Following several promotions, he became gen. sales mgr. in December 1959.

Mr. Leslie succeeds Mr. DeVitt as treas. Following service during World War II, he spent three years with Weyerhaeuser Timber Co. in Oregon before resuming his studies at the Harvard Graduate School of Business Administration. He later joined Canadian Gulf Oil Ltd. and was at the Calgary, Alta. office when he joined Hammermill in 1956. He has been staff asst. to the treas. since 1957.

If you use wax, do you get these three benefits?

Excellent product
 Reliable source
 Skilled technical service

you get them when you specify



WAX

First: There are four ESKAR Wax grades. ESKAR R-50—For special high blocking point, high gloss coatings. Frequently may be substituted for part of micro in blends. ESKAR R-40—For liners and overwraps where sealing strength is important. ESKAR R-35—For saturation waxing and carton applications. ESKAR R-25—For dry waxing, as a process ingredient and miscellaneous uses.

Second: Standard Oil is (1) the largest wax producer in the Midwest, (2) a supplier with a real

interest in serving you, (3) a source you can depend upon to provide you with the quality grade of wax you need, on time when you need it, from refineries and warehouses located with you in mind.

Third: Trained wax specialists are ready to answer your request for help. Ask for this help by calling any of Standard's 48 district offices in the 15 Midwest and Rocky Mountain states. Or write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

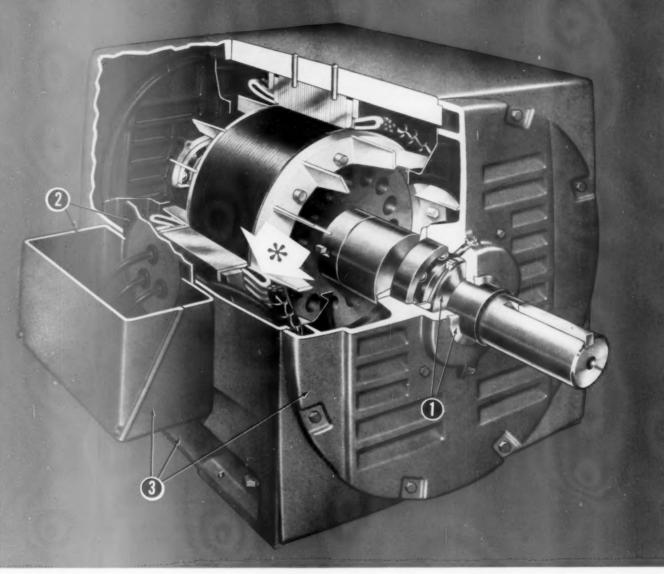
You expect more from



and you get it!

General Electric's CUSTOM '8000' means . . .

MOTORS SPECIALLY DESIGNED FOR PULP AND PAPER MILLS



Water-resistant bearing seals guard Custom '8000'* motors against damage from moisture and chemicals encountered in the pulp mill, bleach plant and other stock preparation areas.

Extra large cast-iron conduit box has gaskets at the split, and between frame and box to seal out moisture. Leads enter box through a steel plate fitted with rubber grommets to complete moisture-proofing.

Frame, end shields, and conduit box are cast iron.
All other parts and hardware are specially treated for corrosion resistance to provide maximum reliability for pulp and paper applications.

IN ADDITION TO THE SPECIALIZED MOTOR FEATURES mentioned above, General Electric Custom '8000' motors offer these superior "standard" features: easily-removable, lightweight, flat end shields simplify motor maintenance; positive-purging lubrication system increases bearing life—prevents grease leakage along shaft

(new sleeve bearing design also available); pre-wound stator core assures uniform high performance; acoustic design reduces motor noise level.

CUSTOM '8000' MOTORS are manufactured to the rigid quality specifications General Electric has adhered to for over 80 years. However, with the implementation of advanced design and manufacturing techniques, General Electric today can accurately and economically customize motors to your specific requirements through utilization of motor components engineered exclusively for pulp and paper applications.

Trademark of General Electric Co.

Progress Is Our Most Important Product

GENERAL 🕮 ELECTRIC





EXCLUSIVE

POLYSEAL * INSULATION SYSTEM LENGTHENS MOTOR LIFE

General Electric's new Polyseal insulation system is designed to give maximum motor protection in pulp mills, bleach plants and other stock preparation areas. Polyseal insulation is a system built to assure superior mechanical, thermal, voltage and environmental endurance. Formwound insulation system utilizes silicone rubber tape reinforced by glass fabric materials and vulcanized, after coil wrapping, to provide a positive seal against moisture and contaminants.



POSITIVE MOISTURE PROTECTION is assured by "under water" production line tests. For example, 2300-volt, form-wound Polyseal coils are completely immersed in water and "hi-potted" at 8000-volts to prove that the insulation system is absolutely sealed.

CALL YOUR GENERAL ELECTRIC APPARATUS SALES OFFICE

for full information on CUSTOM '8000' motors for the pulp and paper industry, or write for Bulletin GEA-6865, to Section 884-10, General Electric Company, Schenectady 5, New York.

Progress Is Our Most Important Product

sales for Cellulose Sales Co. for some 30 years, died in May; he was asst. vice pres, and had spent somewhere between 50 and 60 years in the pulp and paper industry. . . . Donald E. Fraher is named operations mgr. of Champion Paper Specialties Inc., Piqua, Ohio, while David Hughes becomes his assistant. . . . J. K. Vanatta, purchasing advisor and a 31year veteran with Nekoosa-Edwards Paper Co., retired June 1.

Harry Eliason, in charge of Midwest

Robert D. McPheters, formerly technical director of Gould Paper Co., is now research associate, Fiber Products Research Center, Inc., Beaver Falls, N.Y.

J. Walter Juckett, president of Sandy Hill Iron & Brass Works, makes the following promotions: George E. Clink, asst. vice pres.; Charles S. Adams, an asst. vice pres., and Floyd H. Rourke, asst. to the president. . . . B. Frederick Ayer, treas. of Rumford Falls Power Co., becomes asst. treas. of Oxford Paper Co. -Maurice R. Castagne



T. Cecil Davis, asst. treas. of St. Regis Paper Co., becomes resident mgr. of the Pensacola, Fla. mill to succeed William E. Caldwell, named senior vice pres. of the Cornell Paperboard Products Co. div. and gen, mgr, of Cornell operations in Milwaukee, Mr. Davis joined St. Regis Co. (Canada) Ltd. in 1948 as comptroller, became asst. treas, of the parent firm in 1959 and transferred to New York, N. Y.

St. Regis announces the following changes in the Central Engineering div.: Henry W. Wegner is transferred from St. Paul & Tacoma Lumber Co. to the Central Engineering div. as exec. sawmill engineer; he will headquarter in Tacoma, Wash. Robert B. Young, for 13 years with Combustion Engineering Inc., joins the division as staff power engineer at the Jacksonville, Fla. headquarters. James L. Gillespie, formerly with National Container Corp. and Owens-Illinois, goes to Jacksonville as a project engineer. And H. Scott Oglesby, formerly with both St. Regis and Union Carbide & Carbon Corp., also becomes a project engineer at Jack-

In another field of operations, Edward J. McMahon, director of labor relations, is named St. Regis director of industrial relations. He will supervise activities of the New York Industrial Relations dept. under the direction of Alex Smalley, vice pres

The following are named regional industrial relations managers: C. F. Tyler (Northeast); M. F. Maney (Southeast); J. J. Gallagher (Midwest); M. A. Roberts (Northwest), and H. Hewitt (Southwest). New industrial relations representatives are: W. E. Disbrow, V. T. Finan, T. R. Foy and W. I. O'Prev.





Richard

Vernon C. Davis, Purchasing VP, Fitchburg Paper Co.

He has been with the Fitchburg, Mass. firm since 1927, director of purchasing since 1943.

Appointment of Raymond F. Richard as vice pres., paper mill technical services, is announced by George R. Wallace III, president of Fitchburg Paper. Prior to joining Fitchburg, he was with McKinsey & Co., Chicago.

Southern

Howard S. Donald, president of Standard Paper Mfg. Co., Richmond, Va., announces that Joseph E. Hoffmann has been elected vice president and general sales manager, replacing Graham A. Carlton, resigned, Mr. Hoffmann came with the Company in 1938 and, for the past 14 years, has been in charge of the company's sales solicitation office in New York City.

Three paper industry personalities have been nominated by Divie Rusiness magazine as Man of the Year: Union Bag-Camp's James L. Camp, Jr., Coosa River's Edward Norton and Crosset's Peter Watzek. In the past Ernest L. Kurth, Southland Paper Mills, Rueben Robertson, of Champion and Donald Comer, one of the founders of Coosa River have been awarded the honor

C. Braxton Valentine, Richmond, Va., has been elected a member of Chesapeake Corp.'s board of directors. . . . Continental Conveyor and Equipment Co. of Birmingham, Ala., will open a new warehouse in Memphis, Tenn., under the supervision of C. R. Helm. . . . Walter Wood, who has been editor of Sonoco Products Co.'s newspaper and director of public relations for the past seven years has resigned and is returning to his home in Texas. He is succeeded by Jane Easterling, who has been asst. public relations director.

Alan Lincoln Burns has been named administration mgr. of West Virginia Pulp and Paper's Charleston, S.C. mill. He has been personnel mgr. since 1955 and is graduate of Amherst College. Cedric Derby, West Virginia research engineer at Covington, will be a division engineer in New Orleans, at one of the co.'s four bag plants.

PULP & PAPER

Strictly Personal

Myer M. Donosky has joined Perkins-Goodwin Co., with headquarters in Dallas, Texas. Formerly vice pres. and gen. mgr. of Arkansas Dailies Inc. and long associated with newspaper publishing, Mr. Donosky will act in an advisory capacity to the P-G sales office in Texas, located at Lufkin. The firm is exclusive sales agents for Southland Paper Mills Inc. New newsprint sales mgr. at Lufkin is George R. Newcombe, formerly director

of sales research. . . . Buckeye Cellulose Corp. appoints Robert E. Cannon to sales mgr., a newly created position, while Luther P. Gause succeeds him as mgr. of paper pulp sales. Mr. Cannon will be responsible for sales in Europe and general supervision of domestic paper industry sales. . . . James F. Whalen Jr., Midwest district mgr., has been promoted to Southern district mgr., Becco Chemical div., Food Machinery & Chemical Corp.



Otis Langley, Jr., Joins Stein Hall in Atlanta

He will call on integrated paper mills in the South as adhesive sales rep. His area includes Georgia, Ala., Miss., La., Ark. and Fla. He was formerly with Bemis Bros. Bag Company in Mobile, Ala.

Edward G. Peck is named production mgr. at the Richmond, Va. box plant of the Hinde & Dauch div., West Virginia Pulp & Paper Co. He has had 10 years' experience as an engineer in the corrugated industry. . . . George M. Rust is elected vice pres. and J. Bolling Sullivan Jr. and John W. Clark vice presidents of Rust Engineering Co., Pittsburgh, Pa. Their headquarters will be in Birmingham, Ala. . . . William H. Stone is named Southeastern div. mgr. for the paper, textile and food industries in National Starch & Chemical Corp.; he was Midwest starch sales mgr. at Chicago.

C. Cline Peters has been named mill manager of Riegel's pulp and paper mill in North Carolina. He replaces J. D. Dailey, who resigned. Mr. Peters joined Riegel as an asst. plant engineer in 1951, later became plant engineer and then asst.



There's more to a Lodding Doctor than meets the eye

Few qualifications for manufacturing count more than experience. And when experience has been concentrated within a specialized line of endeavor it adds value to the product.

Lodding Doctors carry that extra value derived from experience — experience accumulated over thirty years of specialization in the manufacture of doctors, doctor blades, blade holders and their accessories. During this period, Lodding has built and installed doctors for every conceivable doctoring application, under all conditions and of every type and size, up to and including the Great Lakes Paper Company's 340 inch newsprint machine.

Installations of Lodding Doctors are found in nearly every paper mill in this country and in many mills abroad. Each was precision engineered and precision manufactured for the specific roll being doctored.

Doesn't it make sense to rely on specialized experience? Most mills have found that it does. Next time, get Lodding Doctors. Then you'll profit too.





Moore

Ray

Continental Can Appoints Supts. at Augusta Mill

Brookshire C. Moore becomes paper mill supt. and Charles Ray pulp mill supt. at the bleached sulfate paperboard mill under construction at Augusta, Ga. Mr. Moore's most recent assignments were with Riegel Paper Corp. and East Texas Pulp & Paper Co. Mr. Ray has held pulp mill positions with both Eastern Corp. and Riegel Paper.

ODDING



Sam Loiry is Gen. Sales Manager of Soderhamn

He will direct sales of Soderhamn Co.'s complete line of wood waste utilization equipment. The Ohio State graduate has been with the American Branch of the company since it was founded at Talladega, Ala., in 1951.

production mgr. He is an electrical engineering graduate of Virginia Polytechnic Institute. O. A. Marrow, pulp mill supt. and sec.-treas. of the southeastern div. of PIMA, has been promoted to Mr. Peters' former position of prod. mgr. A. B. Gregory, onetime maintenance supt., becomes asst. production mgr.

comes asst. production mgr.

James H. Watson has been promoted to asst. power plant engineer for International Paper's Southern Kraft Div. He has been in charge of construction of a sawmill for the company's Long-Bell division in Chelatchie Prairie, Wash., for the past year. . . H. Merrill Goodwyn has been named southern regional mgr. for Containerboard & Kraft div. of Continental Can Co. in Dallas. He will also supervise the Atlanta, New Orleans and Southern Pines, N. C., sales offices.—William F. Diehl, Jr.



Cannon

Gaus

Two Executives Named To Sales Posts By Buckeye

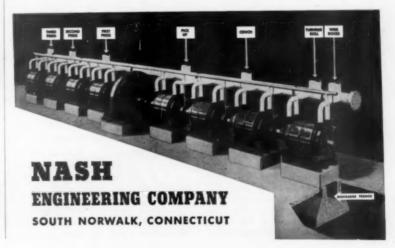
Robert E. Cannon becomes sales mgr., a newly created post, and Luther Gause has been named mgr. of pulp sales. He will direct sales of bleached kraft from Buckeye's Foley, Fla., mill and cotton linter pulp from Memphis. Mr. Cannon, a Georgia Tech graduate, was formerly paper mill supt. at Foley.

This New Nash Vacuum Pump Offers Four Separate Suctions and Vacuums Simultaneously



The Nash 5308-A has four separate suction inlets, each of which functions independently of the others. This offers the machine operator great flexibility, since these may be used in any desired combination to produce a variety of capacities and vacuums.

Picture below shows simple drive possible and flexibility of piping permitting capacities to exactly fit requirements of different sections of the paper machine.



Midwest

Alfred R. Braun, production mgr. at the Eaton, Ohio plant of West Virginia Pulp & Paper Co.'s Hinde & Dauch div., has retired following 44 years in the corrugating industry. He joined H&D in 1916 as an office worker, became production mgr. at St. Louis in 1928 and Kansas City plant mgr. in 1945. He returned to Sandusky in 1949 to take charge of factory production of the Western div. and in 1952 was put on special production assignment for all H&D plants. He came to Eaton in 1956. Mr. Braun is succeeded at Eaton by Sidney Johnson, gen. foreman at the Detroit plant.

Vernon E. Moore becomes Midwest district mgr. for the Becco Chemical div., Food Machinery & Chemical Corp. Formerly West Coast mgr., he will head-quarter in Chicago. Mr. Moore succeeds James F. Whalen Jr., promoted to southern district mgr. . . In another Becco move, Douglas N. Threader is assigned the Ohio-Indiana territory with head-quarters in Cincinnati to succeed Arthur J. Raynor Jr., promoted to West Coast district mgr.

Herbert W. Suter Jr., vice pres., marketing, Champion Paper & Fibre Co. died recently in a Cincinnati hospital. He had been a sales executive with the company since 1937. Mr. Suter's father was sales vice pres. for a number of years and remains an honorary vice pres. . John S. Buchanan is named asst. kraft mill supt. of the Nekoosa, Wis. plant, Nekoosa-Edwards Paper Co. He has been technical asst. to the supt. and at one time was associated with Scott Paper Co. In another Nekoosa mill change, Gustav C. Bonow becomes asst, master mechanic, maintenance dept. He was formerly dept. mill engineer.

Paul L. Breyfogel, asst. supt., becomes supt. of the dry starch section, A. E. Staley Mfg. Co., Decatur, Ill,

The fifth annual Fun Day sponsored jointly by Kalamazoo Valley TAPPI and Michigan PIMA was held June 21 at Gull Lake Country Club, Richland, Mich. Gen. chairman was Dick VanBuren, J. M. Huber Corp., assisted by Marty Craig, Dow Chemical Co. . . W. J. Berg is named to the newly-established position of marketing mgr., Minnesota & Ontario Paper Co. He was formerly district sales mgr. for the Insulite div. at Cleveland.

William J. Zonner, starch sales representative on the Pacific Coast, comes to Chicago as district mgr., starch sales, for the Midwest div., National Starch & Chemical Corp.

Container Corp. of America reports new assignments for three vice presidents and their transfer to Chicago headquarters: Thomas F. Cass moves from San Francisco and is in charge of all folding carton operations as well as the Sefton Fibre Can div.; Harry E. Miles moves



Earl F. Otto Directs Ind. Engineering, CWP&P

He has been serving as maintenance supt. in the Wisconsin Rapids div. of Consolidated Water Power & Paper Co. and as coordinator of inventories. Mr. Otto joined the company in 1915. As director of the Industrial Engineering dept., he will study economic feasibility of special projects and work order proposals, as well as supervise material handling and operation improvement problems. In addition, Mr. Otto will handle real estate and lumber purchases and continue to coordinate inventories and painting.

from Louisville, Ky., in charge of all corrugated operations, and Frederick S. Crysler moves from Philadelphia and has responsibility for all paperboard mills (including linerboard, boxboard, corrugating medium) as well as for Pioneer Paper Stock Co., a subsidiary.

Institute of Paper Chemistry, Appleton, Wis., has appointed **Dr. Arild J. Miller** associate director of admissions; he was formerly professor and chairman of the Dept, of Chemistry, Carleton College, Northfield, Minn.

Gilbert C. Robinson is named regional engineer for the Hinde & Dauch div., West Virginia Pulp & Paper Co., with headquarters at H&D's Chicago plant. He is in charge of enginering projects in regard to equipment and buildings in Kansas City, Kans.; St. Louis, and Chicago.

Bart A. Gaffney becomes gen. sales mgr., folding cartons, for the Cornell Paperboard Products Co. div., St. Regis Paper Co., Milwaukee, and its subsidiary, Carton Craftsmen Inc., Chicago. Leonard J. Ertel, treas. and director of Standard Register Co., Dayton, Ohio, died May 14. —Don W. Zeigler.

A. Justin Smith, Sales Mgr., Ross Midwest Fulton

He was formerly sales engineer for this division of Midland-Ross Corp. Mr. Smith joined Ross Midwest Fulton in 1951 and was assigned the southern territory. At one time (1934-1942) he was with Miamisburg Paper Co., now a division of Kimberly-Clark Corp., W. Carrollton, Ohio.



106

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An experienced staff of laboratory technicians is responsible for the uniformly high quality of De-Airex which enables efficient defoaming with a minimum of material. The particular De-Airex best suited to your mill and your stock, is determined by pre-testing with exclusive equipment right in your mill or in our laboratory, without interfering with your production.



precision metering of paste-type De-Airex

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See how Houghton De-Airex and Personalized Paper Mill Service can eliminate "foam headaches" and save you defoamer dollars. Write E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pa.

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PULP &

Strictly Personal

New Officers Elected

More than 125 members of Kalamazoo Vally TAPPI and Michigan PIMA met in May at Gull Harbor Inn, Kalamazoo, Mich., to elect 1960-61 officers

PIMA officers elected are: Chairman-L. B. Owen, Allied Paper Corp.; first vice chairman-Preston Carter, KVP Sutherland Paper Co.; second vice chairman-Gordon Morseth, Rochester Paper Co., and sec.-treas.-Dr. John Fanselow, W. Michigan Univ.

Officers chosen by TAPPI include: Chairman-W. L. Kite, Simpson Lee

Paper Co.; vice chairman-J. D. Chadderdon, KVP Sutherland Paper Co.; secretary-Arthur Hupp, Watervliet Paper Co., and treas.-Harry Parker, Hodag Chemical Co. Named to the exec. committee were: W. O. Kroeschell, Michigan Carton Co.; Gordon J. Gill, Penick & Ford Ltd.; Andreas von Koeppen, W. Michigan Univ.; R. W. Hagemyer, Wyandotte Chemical Co.; Martin Craig, Dow Chemical Co.; R. M. Levy, Allied Paper Corp.; W. R. Noel, Kalamazoo Paper Co.; H. H. Parker, Hercules Powder Co.; J. C. Tongren, Watervliet Paper Co., and Richard VanBuren Jr., J. M. Huber Corp.



M. Kay Leonard Devel. Engr. For Morden Machines Co.

Formerly member of Morden's laboratory staff, he is now concerned with developing new products and refining existing machines, according to R. Blake Honeyman, vice pres. of this Portland, Ore. designer-producer of stock preparation equipment. Mr. Leonard did design work for Bingham Pump Co. prior to joining the Morden firm.

Pacific

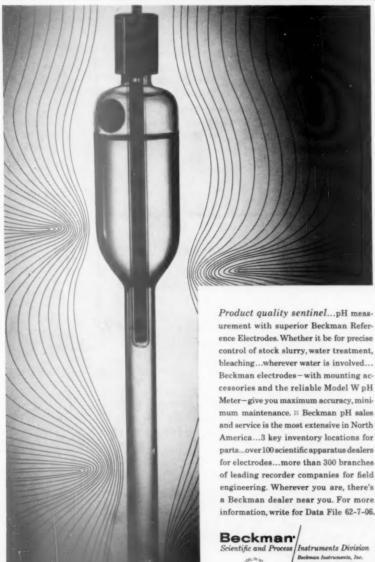
Fibreboard Paper Products Corp. promotes Ralph G. Beauregard, mgr. of the Stockton, Cal. board mill, to manufacturing mgr. for the entire Paperboard div.; Ralph P. McDonald moves up from asst. mgr. to mgr. at Stockton,

Arthur G. Pope, since 1958 sales supervisor for the western district of du Pont's Dves & Chemicals div., Organic Chemicals dept., becomes district mgr. Headquarters of the district have been moved from Los Angeles to Palo Alto, Cal. Richmond M. Stampley becomes sales mgr. for West End Chemical Co., a division of Stauffer Chemical Co. He was formerly mgr. of sodium sulfate and salt cake sales. Headquarters are in San Fran-



Robert T. Kimberlin Assumes Additional Duties at CZ

Retaining his position as vice pres. for corporate development, Crown Zellerbach Corp., he take on duties as secretary of the company, a position held for three years by C. S. Cullenbine, who became administration vice pres. in 1959. Mr. Cullenbine will devote more time to administrative functions.



Product quality sentinel ... pH measurement with superior Beckman Reference Electrodes. Whether it be for precise control of stock slurry, water treatment. bleaching...wherever water is involved... Beckman electrodes - with mounting accessories and the reliable Model W pH Meter-give you maximum accuracy, minimum maintenance.

Beckman pH sales and service is the most extensive in North America...3 key inventory locations for parts...over 100 scientific apparatus dealers for electrodes...more than 300 branches of leading recorder companies for field engineering. Wherever you are, there's a Beckman dealer near you. For more

Beckman, Instruments Division Beckman Instrum



John Carpenter, paper mill shift supervisor at Scott Paper Co.'s Everett, Wash. plant, will assist in the start-up operation of papermaking facilities at the new Bowater-Scott Australia Pty. plant near Melbourne, Australia. He will receive three weeks' training in England before going "down under" this fall to be paper mill . . Western supervisor at the plant. . Kraft Corp., Portland, Ore., appoints Richard B. Keller gen. mgr. of its Western Corrugated div. in Washington and Oregon, the operations including container plants at Beaverton and Wenatchee, sales offices and warehouses at Yakima and Seattle; C. W. Knodell, formerly controller, becomes treas. of the firm.

Charles E. Hoonan, public relations asst. in Crown Zellerbach Corp.'s Portland, Ore. office, becomes public relations representative for the Pacific Northwest. . . . In another CZ appointment, John Ballo, technical asst. to the supervisor of testing and quality control at Camas, Wash., transfers to the Western Waxide div., N. Portland, Ore., as asst. technical supervisor.



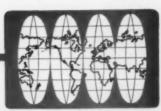
Muckley, Well Known in Paper, Becomes Finance Consultant

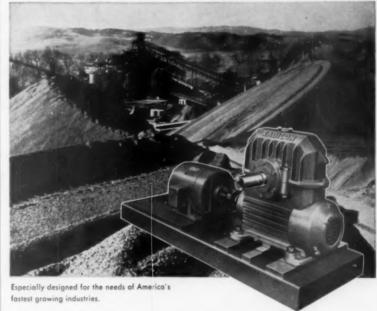
Joseph E. Muckley, for eight years vice pres., finance, Simpson Timber Co., has opened his own office in the Washington Bldg., Seattle, and is serving Simpson as an independent consultant on finance and related matters. Many years intimately connected with the pulp and paper industry, he will continue to have full responsibility for arranging Simpson financing, will also be in charge of the company's defense in a complaint recently filed by the FTC. The complaint arose from Simpson's acquisition of M & M Wood Working Co. in 1956. Mr. Muckley plans to perform similar services for a limited number of other firms.

A 1930 graduate of Yale Univ., he is a former vice pres. of the Seattle-First National Bank, served during World War II as a colonel in the Air Force and prior to that time was with Pacific Northwest Co. in investment banking. He is on the board of Puget Sound Navigation Co., Black Ball Ferries Ltd., Queen City Broadcasting Co., the Equity Fund Inc. and Pacific American Fisheries.

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"Eliminate drive design problems with the versatile new Radicon Complete Drive—just position—set six bolts and you're ready for service."

There's no do-it-yourself involved. Simply select the drive (easy as a gearmotor)—and set! Radicon reducers and motors are already carefully shimmed and aligned on heavy fabricated steel base plates of double box construction, firmly ribbed for rigidity. This means minimum stress at the flexible coupling—low maintenance, with complete versatility for service.

Fan-cooled Radicon Speed Reducers, such as type RHU in the above Complete Drive, are being specified for replacement and OEM in many industries these days. They have learned that Radicons are designed, not for show — but for rugged work in all extremes of temperature, dust, dirt and rain.

Immediate delivery 3" to 12", all standard ratios from 5:1 to 60:1. Radicon complete drives supplied by all authorized David Brown factory branches and distributors.



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PULP & PAPER

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Sundstrom

Lambert

Camas Men Named to New Posts by CZ

Crown Zellerbach Corp. appoints Roland Sundstrom asst. resident mgr., St. Helens (Ore.) div., to succeed Howard Hall, recently named resident mgr. At the same time, James E. Lambert becomes asst. mgr. at the Port Townsend (Wash.) div. to succeed John M. Miller, transferred to Antioch, Cal., as asst. resident mgr. Mr. Sundstrom was formerly technical asst. to the paper mill supt., wrapping, at Camas, while Mr. Lambert was Camas gen. supt. of woodmill, finishing and services.

Bob Lawton, son of R. E. Lawton, industrial and community relations supervisor for Crown Zellerbach Corp., Camas (Wash.) div., is representing Camas as part of American Field Service's foreign student program; he will reside at a Hanover, Ger. home this summer. names Walter E. Koch Jr. resident mgr. Columbia City, Ore. operations-a veneer plant and a sawmill now under construction. . . . Thorsten O. Hammerstrom is controller of the Western Chemical div., Hooker Chemical Corp., Tacoma, Wash.; he will continue as asst. treas. . . . Robert L. Zwald, advertising and sales promotion mgr., Electric Steel Foundry Co., Portland, is elected president of the Oregon chapter of Industrial Advertisers.

Harold E. Wright is named to the new position of vice pres. and director of marketing for Potlatch Forests Inc.'s pulp, paper and converting divisions. He was formerly vice pres. in charge of market development, Diamond National Corp. His headquarters are in Chicago.

L. J. Forrest, mgr. of the Northwest Timber div., Rayonier Inc., Hoquiam, Wash., was elected president of the Assn. of Washington Industries during the annual meeting held in Seattle. He has been

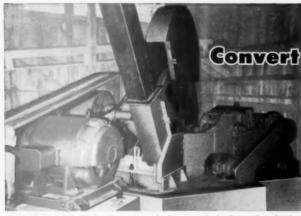


Raymond O. Jones Heads CZ Planning

Mr. Jones was asst. to the president of Gaylord Container Corp. when it merged with Crown Zellerbach Corp. in 1955. Last fall he transferred to CZ's San Francisco headquarters to become asst. to the vice pres., packaging. He was recently promoted to director of long-range planning succeeding Dean O. Bowman, who affiliated with the Autonetics div. of North American Aviation in charge of planning.

vice pres. and a member of the association's board of directors for several years.

Directors of Fibreboard Paper Products Corp., at annual stockholders meeting, advanced Joseph B. Fagot from gen. mgr. of organization & personnel to vice pres.; Vern H. Talcott, mgr. of real property development, to asst. sect. of the firm.



Carthage 60" Slab Chipper with horizontal feed. A five knife machine furnished with or without power feed and with gravity or blowing discharge. Capacity approximately 10 cords per hour. A companion chipper to our popular 39" horizontal slab chipper.

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The Chesapeake Supply & Equipment Co. Forest and Railroad Ave. Dover, Del. REdfield 4-5991

Hyman Supply Co. Wilmington, N. C. ROger 2-5294

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Slabs, edgings, rounds and other waste wood are fast becoming an important source of chips for pulp mills—an important source of needed profit for hundreds of sawmills.

<u>Cash in!</u> There's a Carthage wastewood chipper (size range 39" to 64") exactly suited to your requirements. Don't miss this big extra income.

CARTHAGE MACHINE CO.

Donald B. Pooley is appointed West Coast mgr. for International Paper Co.'s corrugated shipping container and multiwall bag sales. He was previously mgr. of West Coast container sales. . . Arthur J. Raynor Jr., since 1957 sales representative in the Ohio-Indiana territory, becomes West Coast district mgr. for the Becco Chemical div., Food Machinery & Chemical Corp. His headquarters are in Vancouver, Wash.-Louis H. Blackerby.





Key Positions at Simpson Paper Co.

Robert M. Boyle, supt. of converting dept., was appointed asst. mgr. of Everett, Wash. div. of Simpson-Lee Paper Co. In this capacity he reports directly to Maxwell D. Bardeen, president, and assumes responsibilities of gen. mgr. in the latter's absence. David F. Reid transfers from Lee Paper plant, Vicksburg, Mich. to become converting supt. at the Simpson mill.



Simpson Research Chiefs

Appointment of Don F. Laughnan and Reino A. larvi as section chiefs on the Simpson Timber Co. research staff in Seattle is announced by Robert J. Seidl, director of research.

Mr. Laughnan, chemistry major from the University of Wisconsin and supervisory chemist at the Forest Products Laboratory of the U.S. Forest Service in Madison, Wis., for 18 years, has been named section chief in charge of plastics, coatings and wood finishings.

Mr. Jarvi will be section chief of adhesives research. He is a native of Seattle and a graduate of the University of Washington in chemical engineering.

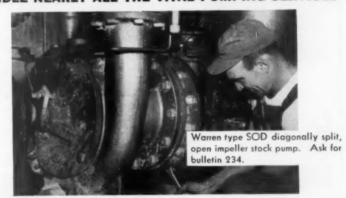
Simpson research will be moving from downtown Seattle to a new laboratory in Overlake Park, between Bellevue and Redmond, Wash.

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OF DIAMOND NATIONAL CORPORATION

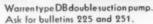


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More than 120 WARREN PUMPS

are operating at the new Diamond National plant at Red Bluff California

With the help of Warren engineers, the progressive planners of this modern integrated forest products plant selected nearly the entire range of Warren stock and water pumps. That's a sound indication of implicit trust in Warren's ability to design and produce the most efficient pumps for all types of plant services.



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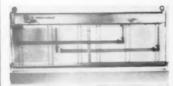
superior to any other method to control flying insects

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Post Installation—all weather 55" wide, 40½" high, 6" thick two 4" black light tubes—108 lbs.



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15 MODELS OFFERED

- 20 year life expectancy
- · Completely automatic
- Full electric operation
- No moving parts
- · Maintenance negligible
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- In dozens of mills here and abroad

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New TAPPI Section in Far West



Dr. P. E. Nethercut, secretary-treasurer, national TAPPI, was on hand when Golden Gate District became Golden Gate Section of TAPPI.



John A. Hartsock, (left) International Paper Co., chairman Golden Gate Section TAPPI, receives the section charter from J. R. Lientz, (right), Union Bag-Camp Paper Corp., national chairman, TAPPI.

It was a big night for members of TAPPI in northern California, May 10, for J. R. Lientz, Union Bag-Camp Paper Corp., Savannah, Ga., national chairman, TAPPI, and Dr. P. E. Nethercut, secretary-treasurer, national TAPPI, came to the meeting at Berkeley to present the section charter to Golden Gate section.

The very first section of TAPPI was the Pacific section in the Portland, Ore.-Seattle area, created many years ago—so now the Far West boasts the oldest and the youngest sections.

Since its inception several years ago the group has operated as a district under the Pacific Section, but now has achieved independent status as a section.

John A. Hartsock, International Paper Co., presided at the meeting.

New officers were elected for 1960-61.

H. W. Theller, Crown Zellerbach Corp., chairman; H. L. Rammer, Fibreboard Paper Products Corp., vice-chairman; W. R. Brandt, General Aniline & Film Corp., secretary-treasurer; L. G. Maclise, Dow Chemical Co., recording secretary; D. F. Church, Crown Zellerbach Corp., and E. R. Padavic, Container Corp., executive committee.

Dr. J. R. McCarthy, University of Washington, gave the Robert M. True Memorial lecture. He spoke on the problems of higher education, illustrating his talk with colored slides of various European universities. The main problems, according to Dr. McCarthy seem to be the increasing number of students wanting a higher education; the increasing demand for graduates with advanced and diverse training; and the financing of the increasing number of university students.

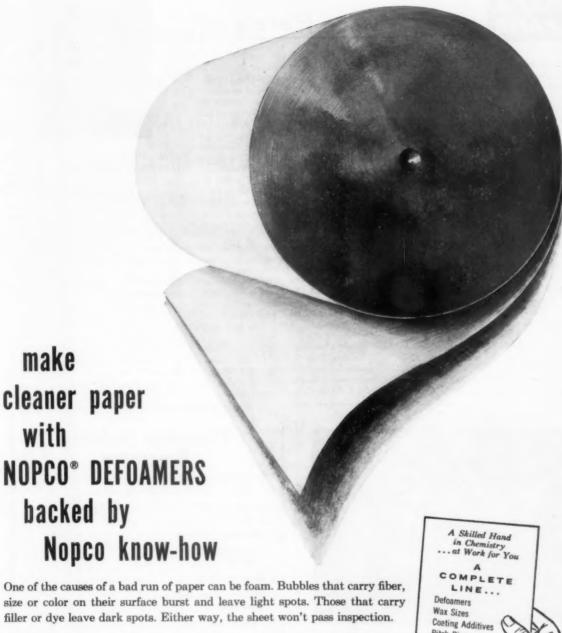


New officers Golden Gate Section, TAPPI: I to r-chairman, H. W. Theller, Crown Zellerbach Corp., D. F. Church and E. R. Padavic, executive committeemen; secretary-treasurer, W. R. Brandt, General Aniline & Film Corp.; recording secretary, L. G. Maclise, Dow Chemical Co. H. L. Rammer, Fibreboard Paper Products Corp., vice-chairman, was not present when the picture was taken.

Pulpwood

H. James Andersen has joined the Halifax Peper Co. div., Albemarle Paper Mfg. Co., at Roanoke Rapids, N. C., as cooper tive conservative forester. He will assist tree farmers with land management problems and coordinate the various ac-

tivities of company field representatives in contacts with private land owners. Mr. Andersen, formerly feature editor for American Forest Products Inc., will also direct forestry public relations functions. . . . In another Halifax move, Robert J. Hare becomes wood procurement supt.; he was Wood dept. area mgr. in the Raleigh-Durham district.



One of the causes of a bad run of paper can be foam. Bubbles that carry fiber, size or color on their surface burst and leave light spots. Those that carry filler or dye leave dark spots. Either way, the sheet won't pass inspection.

Many variables contribute to foam formation. Since each mill has its own distinct foaming problems-because of differences in equipment, type of water, chemicals used and running speeds-it takes a wide range of defoamers to meet them all. Let your Nopco specialist work with you to develop the best system for your conditions. Write for specific information and for literature.

Coeting Additives Pitch Dispersants Metallic Soaps Rag Cooking Surfactants Felt Washing Detergents Calender Stack Lubricants **Antiblocking Agents** Dewaxing Agents Polyethylene Emulsions



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PULP & PAPER

Strictly Personal

L. N. Rees, 58, logging mgr. of Crown Zellerbach Corp.'s Cathlamet, Wash. and Clackamas, Ore. logging divs. since 1945, died March 24 at a Portland hospital. He is widely known in the industry as inventor of the Rees air-tongs and other logging equipment . . M. Gasperi, forest engineer of Crown Zellerbach Corp., Clackamas (Ore.) Div., resigns to become director of Central Italy Tree Farm, Florence, Italy.

Kurt Munnich, forester at Coos Bay Pulp Corp., Empire, Ore., transfers to Scott Paper Co.'s Everett Woodlands div. as asst, mgr. of the Stillaguamish Tree Farm. Fred Dawson, asst. forester at Empire, is promoted to tree farm mgr., a new position for Coos Bay Pulp. . . . Clarence G. Thompson, head of the Agricuture Research Service's insect pathology laboratory at Beltsville, Md., joins the staff of the Pacific Northwest Forest & Experiment Station to direct basic studies in diseases of forest insects. According to R. W. Cowlin, station director, this research will focus on ways to control destructive insects by means of viruses, bacteria and other disease-causing microorganisms. Facilities are being set up at Oregon State College for the program.

Bert Ross, 61, who retired last year as logging supt. at Crown Zellerbach Corp.'s Neah Bay div., died recently in a Florence, Ore. hospital; he had served 20 years in the firm's Washington and Oregon woods operations. At the time of his death, Mr. Ross was serving as a director of the Pacific Logging Congress. Robert M. True is named woodlands

Robert M. True is named woodlands mgr. by S. D. Warren Co., Westbrook, Maine, to succeed the late Edmund C. Melcher. A director of the American Pulpwood Assn., Mr. True joined S. D. Warren in 1951 as chief forester and prior to his present appointment was woodlands mgr.

C. S. Herr, vice pres. in charge of woods operations, has accepted for Brown Co., Berlin, N. H., the John Pearce Award of the Northeast section, National Wildlife Society. Presentation was made in recognition of company efforts in preserving the deer herd by leaving uncut areas of softwood, where deer yard during the winter.

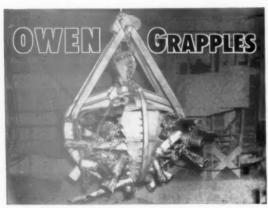
Robert Chapleau is named vice pres. of Matane Pulp & Paper Co., Quebec supplier of wood to pulp mills; he was formerly woodlands mgr. for Richmond Pulp & Paper Co. of Canada Ltd. . . .



C. W. Richen Heads Industrial Forestry Assn.

Mr. Richen, northwest timber operations mgr., Crown Zellerbach Corp., Portland, Ore. was elected president of Industrial Forestry Assn. at that organization's 26th annual meeting. Other officers are: Werner Mayr, Mayr Bros. Logging Co., Hoquiam, Wash., vice pres., H. W. Freed, Longview Fibre Co., Longview, Wash., treas., R. P. Conklin, Cascades Plywood Corp., Portland, Secty., W. D. Hagenstein, exec. vice pres., N. E. Bjorklund, asst. secty.

James C. Space, sophomore at the Univ. of Idaho College of Forestry, is winner of the Northwest Undergraduate Forestry Scholarship awarded by St. Regis Paper Co.; extending over two years, the grant is valued at \$1,600.



A SAFE INVESTMENT

In addition to the independent tine action (an exclusive OWEN patent) that gives OWEN Grapples greater grabs and larger log loads, you will find them more dependable and real time and money savers. A complete line of models and sizes, in both 4-prong and open side types.

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- Hot Acid Systems
- Independent Recovery Systems
- Recovery Towers
- Digester Circulating Systems
- Chip Distributors
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- Spray-Type SO₂ Gas Cooling Systems
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- Hydroheaters
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- Provides approximately 2½ times more external heat transfer surface than plain tubing of equivalent size.
- Increases effective capacities of existing plain-tube heat transfer units.
- Permits size reduction and material savings in new units.
- Available in all sizes, gauges, stainless analyses and lengths generally required for heat exchangers and condensers.
- Approximately 16 spiral fins per inch
 of length with standard height of
 0.0575". Diameter of finned portion
 is 0" to 0.025" less than diameter of
 unfinned portions.
- Continuous or spaced finned sections can be supplied.
- Produced from plain-surface tubing of heat exchanger quality on most modern finning equipment.

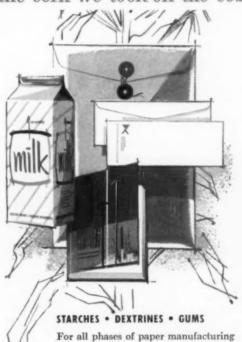
Call your nearest Carpenter representative or the mill for prices, delivery and other information. Ask for Bulletin IFT. The Carpenter Steel Company, Alloy Tube Division, Union, N.J.



Stainless Tubing & Pipe



Look what happened to the corn we took off the cob





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and converting ... beaters, tub sizing,

coatings, calendering, corrugating

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112Z Royce Ave. 1455 Bay Shorte Brd. 0.22 Journe no. COLUMBUS, GA., 2319 Hamilton Rd. NEW ORLEANS, LA., 314 Gired St. SPARTANBURG, S.C., 371 Crestriew Dr. GREENSBORD, S.C., 3226 James Pl. PHILADELPHIA, PA., Bourse Bidg. CHICAGO, ILL., 750 S. Clinton General Offices: ST. LOUIS, MO., 721 Pestalezzi St.

Strictly Personal

Canada

John H. Lamprey, president of Yorkshire Corp., Vancouver, B.C., and a former president of the Vancouver Stock Exchange, has been elected a director of MacMillan, Bloedel & Powell River Ltd. During World War II he served as deputy controller of supplies for the Canadian government and later as deputy timber controller at Ottawa.

Summer Meeting in Canada

The Banff Springs Hotel, Banff, Alberta, will be the scene of the 1960 Summer Meeting of the Technical Section, Canadian Pulp and Paper Assn. Sessions will begin at noon Tuesday, Sept. 6, and end Friday noon, Sept. 9.

The theme is "Towards More Complete and Efficient Use of Raw Materials and Manpower Resources.

A visiting delegation from the British Technical Section will be present.

All reservations should be made through Mr. D. A. Williams, Manager, Banff Springs Hotel, Banff, Alberta.

Dwight F. Brooks has been appointed mgr., fine paper sales, for MacMillan, Bloedel & Powell River, Vancouver, B.C., in anticipation of the early completion of the company's new mill at Annacis Is., B.C., and P. I. (lack) Woolley has been made representative, fine paper sales, both reporting to A. A. Hugman, mgr., Paper Sales div. Mr. Brooks, a member of one of the families who founded Powell River Co., has had wide experience in the paper field following five years with Powell River and various mills and paper merchants in the U.S. Mr. Woolley, a native British Columbian, brings more than 17 years' experience in paper and printing to

industry. Peter Meredith, formerly plateware sls. supervisor of Dominion Bridge Co. Ltd., Vancouver, B.C., joins Yarrows Ltd. at Victoria as sls. mgr.

the company, having been associated

with several large organizations in the

Glenn C. Ritchey, Pembroke, Ont., is appointed vice pres. and gen. mgr. of Radar Pneumatics (Eastern) Ltd. He will have charge of the territory eastward from Manitoba.







Robinson

Scott

Sawver

Celgar Ltd. Names Three to Supervisory Posts

R. A. (Tony) Robinson becomes operating supt. at the pulp mill now under construction at Castlegar, B. C. For the past five years he has been responsible for kraft and semichemical pulping at a New Brunswick mill. Norman Scott, an ordained minister in the Baptist Church and formerly personnel asst. at the Prince Rupert, B.C. mill of Columbia Cellulose Co. Ltd., is named industrial relations supt. at Celgar. And John B. Sawyer, project engineer at Celgar, is appointed plant engineer. He was at one time asst. to the director of engineering at Prince Rupert.

Harry K. Collinge has been elected a vice pres. of North Western Pulp & Power Ltd., jointly owned by St. Regis Paper Co. and North Canadian Oils Ltd. Mr. Collinge is res. mgr. of the company's bleached kraft mill at Hinton, Alta.

Thomas F. Willers was recently elected president of Hooker Chemicals Ltd., North Vancouver, B.C. He is also vice pres. of Hooker Chemical Corp. in charge of its four divisions as well as corporate engineering. R. A. C. Douglas, Vancouver attorney, was elected a director of Hooker Chemicals. . . . Robert R. Alpen Industrial Equipment Ltd., West Vancouver, B. C., is named agent in British Columbia for Infileo Inc., Tueson, Ariz. Headquarters of Infilco (Canada) Ltd. are in Montreal. President of the West Vancouver firm is Robert Alpen.-C. L. Shaw.

Five Promoted by Anglo-Newfoundland Development







Ryan





Blackmore Delaney

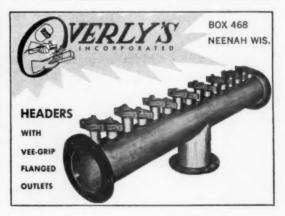
Down

Maloney

Joseph Blackmore, formerly asst. paper mill sunt., becomes sunt, to succeed James Delaney, named paper mill consultant. John Ryan is appointed asst. mill supt. and Cyril Down asst. paper mill supt. Wilfred P. Maloney, in the Town Engineering dept., is made town engi-

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FOR QUICK DISPERSION

The uniformly fine particles of OR-540 wet quickly and disperse easily, evenly give your paper coatings the utmost in opacity, whiteness and finish. Ask your Cyanamid Pigments representative for complete information.

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DeZurik Valves-2-way, 3-way or 4-way-THE finest PAPER MILL VALVES YOU CAN USE!



In straight-way or multi-port styles,
DeZurik Valves give you exactly
the advantages you want!
They operate easily—every time!
They shut dead tight. They're completely
free from constant, expensive maintenance.
And they last longer, too!

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NEWS OF SUPPLIERS TO THE INDUSTRY

Robt. J. Blaine Joins Monarch Forge & Machine Works

. . . as chief engineer. Experienced in the fields of pulp and paper machinery heavy construction, he has been senior design engineer for Willamette Iron & Steel Co. and asst. chief engineer at Lamb-Grays Harbor Co. Inc.



F. H. Singletary Joins Appleton Woolen

... Mills as southern sales representative. His territory includes Mississippi, Arkansas, Texas, Louisiana and parts of Alabama and Tennessee. He was on the sales staff of the Wisconsin firm from 1954 to 1957, left to take charge of southern sales for Eastwood-Neally Corp. and returned to Appleton Woolen in his new position.



Wisconsin Wire Works Promotes W. N. Drever

He becomes works mgr. of the Appleton, Wis. company. Mr. Dreyer has been with Wisconsin Wire about one year as an engineer. He was formerly a professional engineer for the Bolta Products div. of General Tire & Rubber Co., where he specialized in development of synthetic filaments.



Dominion Engineering Appoints Four









Plant

Goldsmith

Vaughan

William

G. D. Lewis, exec. vice pres. in the Heavy Machinery group, Dominion Engineering Works Ltd., reports appointment of G. E. Plant as mgr., Paper Machinery div.; he was formerly asst. mgr. P. H. Goldsmith, sales mgr. in the division, becomes special consultant assigned to liaison work with the paper industry. R. P. Vaughan succeeds Mr. Goldsmith as sales mgr. S. C. Williams continues as division chief engineer.

MEETING DATES

August 22-24

14th TAPPI Alkaline Pulping Conference Multnomah Hotel, Portland, Ore.

August 24-27

TAPPI Forest Biology Symposium New Washington Hotel, Seattle, Wash.

September 1-3

New York-Canadian PIMA (Fall Meeting) Saranac Inn, Upper Saranac Lake, N. Y.

September 6-9

Technical Section CPPA (Summer Meeting) Banff Springs Hotel, Banff, Alta.

September 18-21

National Paper Trade Assn. (Semi-Annual Fall Meeting) Conrad Hilton, Chicago

September 22-23

Northwestern PIMA (Fall Meeting) Northland Hotel, Green Bay, Wis.

September 27-29

11th TAPPI Testing Conference Pantlind Hotel, Grand Rapids, Mich.

September 30-October 1

Pennsylvania-New Jersey-Delaware PIMA (Fall Meeting) Pocono Manor Hotel, Pocono Manor, Pa.

October 6-7

National Assn. of Corrosion Engineers (Western Region Conference)
Sheraton-Palace Hotel, San Francisco, Cal.

October 6-8

National Assn. of Corrosion Engineers (Southeastern Region Conference)
Dinkler-Plaza Hotel, Atlanta, Ga.

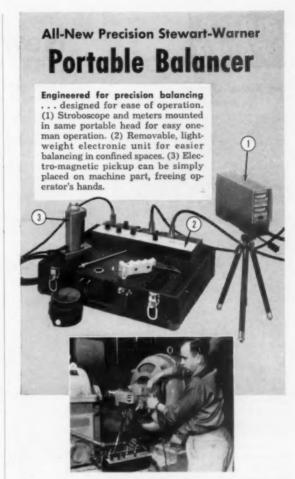
News of the Suppliers . . .

Stauffer Chemical Co. has made its first shipment of saltcake by water to its new bulk depot at Nanaimo, Vancouver Is., B. C.; the facility serves area pulp and paper mills. . . F. C. Huyck & Sons has announced a name change to Huyck Corp.; Huyck Felt Co. will retain its identity as a separate division . . . Hooker Chemical Corp. has made available its entire portfolio of U. S. and Canadian patents on pulp bleaching and related processing to manufacturers on a royalty-free license basis. . . . Southworth Machine Co. is appointed sales agent for cutters, delivery systems, counters and markers, inspection units, backstands and related equipment in the U. S. and Canada for Hamblett Machine Co. and Maxson Automatic Machinery Co.

Minerals & Chemicals Corp. of America, Philipp Bros. Inc. and Philipp Bros. Ore Corp. are considering merger of the three firms; the new corporation would be known as Minerals & Chemicals—Philipp Bros. Inc. . . Midland-Ross Corp.'s Ross-Midwest-Fulton div. has broken ground for new head-quarters offices in Kettering, Ohio. . . . A multizone heat treating furnace capable of producing extremely high temperatures has been installed at the Lawrence, Mass. plant of John W. Bolton & Sons Inc.; it is to be used primarily in preparation of steel for forging and rolling operations.

Growth of the Air Systems organization from a department to division status has been announced by Black-Clawson Co. . . . Stauffer Chemical Co. has reorganized its Industrial Chemicals Sales dept.; major aspect is creation of the positions of national product managers, who—along with the field sales organization—will report directly to Roger W. Gunder, vice pres., sales. . . . Colton Chemical Co., a division of Air Reduction Chemical Co.

pres., sales. . . . Colton Chemical Co., a division of Air Reduction Co. Inc., will build a resin plant at City of Industry, Los Angeles County, Cal.; facility will be devoted to resin polymerization and will produce Flexbond and Vinac resins. . . .



Cuts maintenance costs by enabling you to eliminate even smallest vibrations...also balances turbines, pump impellers, rebuilt electric motor rotors and many other machine parts!

Stewart-Warner's new portable balancer is priced to make it economical for even small mills to own their own balancing equipment. Its portability permits easy in-place balancing and vibration analysis of assembled machinery. Indicates angle and amount of unbalance . . . determines rpm and amount of vibration. Pays for itself almost immediately by enabling you to reduce vibration . . . to cut maintenance costs . . . to increase operating speeds.

Also: a complete line of permanently installed cradle type balancers to meet every job type or short run precision balancing requirement.

MAIL COUPON FOR FULL DETAILS!



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PULP & PAPER

New Equipment Section

Log Kicker-Clamp



Applications: For increased log-handling efficiency on 2- and 4-wheel drive Hyster units in the 15,000- to

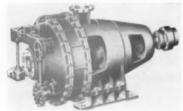
20,000-lb, capacity range. Advantages: Kicker utilizes pair of push-off arms to roll logs off heavyduty load arms. Clamp arms with maximum opening of 144 in. swing through a 105-degree arc to hold logs on forks. With kicker and clamp combined, same hydraulic cylinders operate both sets of arms in sequence. As clamp begins to open, kicker is inactive. As clamp arms continue opening swing, kicker arms are automatically actuated to push logs off the forks.

Specifications: Unit available as kicker only, as clamp only or as kicker-clamp combination. Net capacity of kicker-clamp combination at 24-in. load center ranges from 11,800 lbs. with Hyster Challenger 150 to 17,400 lbs. with Hyster Challenger 200. Capacities are greater when kicker or clamp are mounted alone.

Supplier: Hyster Co., 2902 N.E. Clackamas St., Portland 8, Ore., Tel: AT 8-5011.

Refiner

. . . Presents New Design Concept



Applications: For either defibering or refining.

Advantages: Disco-Finer, says the manufacturer, provides "exceptional precision and high quality of stock preparation" due to the new design principle, which introduces automatically self-aligning rotor and stator plates that remain in perfect parallel relationship. Due to semi-conical de-

sign of rotor and stator, misalignment and distortion of discs is eliminated. Conversion is easily made by changing direction of flow and plates. Power consumption per ton of production is said to be very low.

Specifications: Disco-Finer is self-pumping and self-pressurizing. Variety of refiner plate designs and materials may be used. Designed for high production, unit provides 500 to 700 connected hp.

Supplier: Morden Machines Co., 3420 S.W. Macadam Ave., Portland 1, Ore.

Submersible Pump ... For Wells Up to 1,450 Ft.



Applications: For any installation requiring a large volume of water from

6-in, or larger deep wells.

Advantages: Heavy stainless steel shaft, coupling and non-corrosive intake screen are said to eliminate all problems of rust and corrosion. Motors are water-lubricated, pre-filled, requiring no external lubrication; motor leads are fully protected by heavy-gauge stainless steel guard. Units can be readily dismantled in field for inspection or repair.

Specifications: Built in 16 sizes from 5 to 40 hp, the pumps provide capacities of up to 180 gpm from well depths to 1,450 ft. Bowl assemblies vary in number from two to 23 depending on well depth. They feature heavy cast iron bowls with corrosion-resistant baked-on alkyd melamine finish, bronze impellers and stainless steel fastenings. Tandem bearings located in each stage are leaded bronze and Goodrich cut-less rubber.

Supplier: Goulds Pumps, Inc., 208 Black Brook Road, Seneca Falls, N.Y., Tel: 354

Guardistor Motor

. . . Positive Inherent Protection

Applications: For any a-c use. Advantages: Motor protection based on sensitivity of the positive temper-ature coefficient (PTC) thermistors to any heat build-up in the motor winding alone. Line currents have no affect. The contactless PTC thermistor is an integral part of motor. Each is encapsulated in epoxy resin. Thisplus motor insulation-provides resistance to moisture, chemicals and oils. Specifications: Thermistor is not affected until it reaches pre-determined critical temperature, at which point, unit has a 100:1 positive change in resistance versus temperature. Thermistors have been tested beyond 100,000 switching cycles without significant change of properties.

Supplier: Westinghouse Electric Corp., P.O. Box 2099, Pittsburgh 30, Pa., Tel: EXpress 1-2800.

Reciprocating Shower Pipe ... for Fresh or White Water



Applications: To reduce foam accumulation.

Advantages: According to the manufacturer, the new shower makes a contribution to increased wire life, improved sheet formation, decreased downtime and water conservation.

Specifications: Available in diameters

ranging from 1½ to 6 in. and in lengths up to 375 in., the reciprocating shower comes as a complete unit. Reciprocating movement is actuated by an automatic, reversing pneumatic cylinder that is adjustable to desired length of stroke and speed. Pipe is supported by rubber rollers mounted on sealed bearings. Stainless steel brushes are internally positioned in line with the nozzles.

Supplier: John W. Bolton & Sons Inc., the Emerson Mfg. Co. div., 9 Osgood St., Lawrence, Mass., Tel: MUrdock 6-6171.

Solution to pollution...



cuts water consumption 62%

State regulations required a leading Midwest paper mill to clarify its waste water—to remove the cellulose, cotton fibers, clay, chemicals, starch and dye.

Looking for a low-cost clarifying method, the firm found an answer that not only cut equipment cost, but is actually saving 62% on water consumption. The REX VERTI-FLO CLARI-FIER shown above is so efficient that it allows the firm to re-use 62% of the water formerly wasted—reclaiming 5 m.g.d. out of an 8.5 m.g.d. requirement.

400% BOOST IN CLARIFYING CUTS TANK COST

Due to its unique clarifying technique, this REX VERTI-FLO Tank is just one-fourth the size of

a conventional tank. Yet, it handles the same volume of water and provides a far clearer effluent. Savings here in tank construction cost and space are obvious.

Interested in turning waste water into profit, and in eliminating pollution the economical way? Write for information on the complete line of Rex Water and Waste Treatment Equipment. CHAIN Belt Company, 4691 W. Greenfield Ave., Milwaukee 1, Wisconsin.



NEW EQUIPMENT AND SUPPLIES

High-Speed Bag Machines ... Savings in Paper Claimed



Applications: For manufacture of notion and millinery bags.

Advantages: Rotacut units are said to be world's fastest for notion and millinery bags. Paper savings is realized since bottom on small bags can be as little as ½ in, and on 17 x 21-in. bags only ¾ in. Bottom of the bags are accurately folded giving a perfect lip. Specifications: No. 6 Befanco will produce bags up to 22 in. wide and 24 in. long and square bags up to 17 x 4 x 24 in. Bags can be made at the rate of 400 per min. and with ¾-, ¾-or (with envelope attachment) up to 2½-in, lip.

Supplier: Beasley, French & Co. Inc., 110 E. 31st St., New York 16, N. Y., Tel: LExington 2-6664.

Reciprocating Shower Pipe ... Claims Four Major Advantages

Applications: For mills using either fresh or white water systems.

Advantages: Equipment is said to "make an important contribution" to an increase in wire life, an improvement in sheet formation, a decrease in downtime and conservation in water use.

Specifications: Available in diameters ranging from 1½ to 6 in. and in lengths of up to 375 in., the reciprocating shower comes as a complete unit, including the actuating mechanism, flexible rubber air inlet hose, for connection to mill supply line; and Reciprocating movement supports. actuated by an automatic reversing pneumatic cylinder adjustable to the desired length of stroke and speed. The shower is equipped with anticorrosive nozzles in any orifice required. Stainless steel brushes are internally positioned in line with the

Supplier: Emerson Mfg. Co., div. of John W. Bolton & Sons Inc., Lawrence, Mass., Tel: MUrdock 6-6171.

Embosser

... with Matched Steel Rolls



Applications: For imparting surface design either as a separate installation or as an attachment to rewinders, folders or printing presses.

Advantages: Unit features air-loaded steel rolls with precision adjustable nip control, allowing positive adjustment. If rolls are separated, they can be returned to original operating position accurately.

Specifications: Embosser has fullyenclosed, oil-lubricated herringbone gears and precision spherical roller bearings with tapered inner race arranged for hydraulic removal. Automatic cleaning and lubricating of rolls is featured.

Specifications: Embosser has fully-Co., Green Bay, Wis.

W E M C O the INCREDIBLE Torque-Flow pump

PUMPED!

Could your present pumps pass this abrasive slate plus a nine-inch piece of ½" steel? The Torque-Flow pump did—with ease! Think what this means for your toughest of pumping problems! Its solution is as near as your nearest Wenner representative.



Air Compressor

... Virtually Eliminates Vibration



Applications: For industrial uses. Advantages: The new X-shaped unit is said to be the first major air compressor design innovation in 15 years and to virtually eliminate vibration. It is thus less costly to operate, since less maintenance is required.

Specifications: Unit available in sizes from 1.5 to 15 hp and pressures from 60 to 250 psi. A "Monobloc" model is available in 1.5-, 2-, 3- and 5-hp sizes. In the "Monobloc," compressor and motor form are an integral unit. Otherwise, equipment is belt-driven. There are no exposed moving parts.

Supplier: Worthington Corp., Harrison, N.J.

NEW IDEA IN MATERIAL HANDLING CUTS COSTS AT BIRD & SON, INC.

From

Converting Mill . . .

Via Conveyors

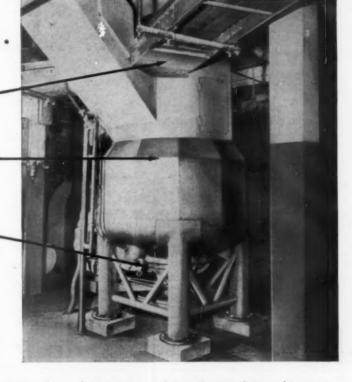
To Pulper.

To Pump*

To Pulp Mill

With the Impco Solvo Pulper

The Model 2U Solvo Pulper, playing a dual roll at Bird & Son, Inc., East Walpole, Massachusetts, has sharply reduced previous material handling costs. It is operating continuously under automatic control as both a material handler and a pulper. Boxboard broke from the converting machines is delivered by conveyors to the Solvo which simultaneously pulps and pumps it to the pulp mill. The units' single 50 HP motor handles both pulping



and pump-away demand at a 24 ton/day rate.

This is one of a wide variety of Solvo Pulper applications. Others include de-ink cooking, dry end broke handling, paper machine furnish pulping, transfer of high yield cooked chips to refiners as well as the normal pulping of broke, wet strength and waste paper. Units are available for any capacity requirement.

*The pulping element, extractor plate and stock pump are one rotating assembly.



IMPROVED MACHINERY INC.

NASHUA, NEW HAMPSHIRE

In Canada: Sherbrooke, Machineries Limited, Sherbrooke, Quebec

News from the Industry

Puget Sound Industrial Sites for Scott, Western Gear

Western Gear Corp. recently purchased 37 acres of the former U.S. Navy shipyard at Everett, Wash. Other sections of the 72-acre yard were taken over by Scott Paper Co., whose present Everett plant is contiguous to the property, and Pacific Tow Boat Co.

Western Gear's acquisition, according to company announcement, "paves the way" for a major modernizationexpansion program. This will involve gradual transfer of all of the firm's Seattle plant operations to the acquired plant as machine and fabrication shops are adapted. T. J. Bannon, Western Gear president, says the firm does not intend to enter the shipbuilding field.

The Seattle plant produces maritime equipment and heavy equipment for pulp, paper, lumber and others.

One Massachusetts papermaker, a century ago, imported mummies and used the cloth for papermaking. It was the first "mummy pa-'There was a shortage of rags for paper.

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. . . for ceramic cones in Centri-Cleaners by Bauer Bros. Co., Springfield, Ohio. Says the manufacturer: "Ceramic cones outlast metallic cones of the hardest alloys as much as 10 to 1. even where highly abrasive pulps are cleaned." New cone, available as optional original equipment or as a replacement part, is said to have these advantages: (1) extreme resistance to friction, heat, shock; (2) strength of cast iron; (3) self-cleaning and selfpolishing action; (4) simple installation, and (5) on larger cleaners cone replaces both the lower cone and underflow nozzle.



Stora Kopparbergs Specialists Aid in Canadian Mill Project

Work is progressing satisfactorily on the new Nova Scotia Pulp Ltd. bleached 2-stage sodium base sulfite mill near Port Hawkesbury, Scotia, and it will be in production early 1962, according to Karl Clauson, president of the Nova Scotia company and also of Stora Koppar-

berg Corp., New York.

Dr. Bertil Lunden, chief engineer of the Skutskär mill in Sweden, who was in charge of planning and development engineering there under Per Collin, mill manager, is spending much of his time in Nova Scotia. He travels back and forth form Sweden and is one of the principal advisors to Walter Holland, who is vice president and general manager of Nova Scotia Pulp Ltd., according to Mr. Clauson.

Stora 59 pulp will be made at Nova Scotia. The process, introduced in 1955 at Skutskär, and now made under license also by Mo och Domsjö AB., Örnskoldsvik, Sweden, is the process to be used in the new Canadian mill

Hans Lindberg, one of the district foresters for Stora Kopparbergs in Sweden, has moved to Nova Scotia to be the woodlands manager for the new mill, Mr. Clauson said. Canadian spruce and balsam will be the raw material. In Sweden, pine is used in the Stora 59 two-stage process.

Another important development is that Karl N. Cederquist, chief of Stora Kopparbergs Berglags AB Central Laboratory for Pulp and Paper at Falun, Sweden, is postponing his retirement for a year, until 1961, in order to assist in the technical planning for the Nova Scotia mill. It is believed that Mr. Cederquist has devoted more years to investigations of soda base sulfite pulping than any other scientist in this industry. Stora's studies have extended over a period of 35 years.

Stora owns 80% and Scott Paper Co. owns 20% of the Nova Scotia mill. Consulting engineers are Charles T. Main Co., Boston.

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Celanese Reorganizes Canadian Companies

Important organizational changes announced by Celanese Corp. of America and its Canadian affiliates are designed to give the company's extensive Canadian operations greater autonomy.

As a result, Columbia Cellulose Co., which operates a 400-ton high alpha pulp mill at Prince Rupert, B. C., and Celgar, Ltd., now building a \$50,000,000 500-ton bleached sulfate mill near Castlegear, B.C., are being welded into a single unit, while two other Celanese subsidiaries — Canadian Chemical and Chemcell Fibres will comprise another unit. All four have been, in essence, owned by Canadian Chemical & Cellulose Co., a holding company for Celanese in Canada which now passes out of the picture.

Shareholders in Canadian Chemical & Cellulose will take possession of a share of each of the two parts, Columbia Cellulose Co. and Canadian Chemical Co., the two operating units continuing under the new setup.

A new Canadian subsidiary known as Chemcell Ltd., headed by M. W. Mackenzie as president, co-ordinates the overall Canadian operations, together with their affiliated companies throughout the world.

The investing public will have the opportunity to take a direct interest in their equity rather than an indirect interest through the holding company.

Suppliers Make News

Miles Chemical Co., Zeeland, Mich., is in semi-commercial production of a new chemical currently being evaluated for multiple applications in papermaking. Sumstar is a polymeric dialdehyde, an organic chemical made from starch, and is said to impart both wet and dry strength. It also may favorably affect such characteristics as oil and grease resistance, tensile strength, elongation, stiffness and porosity. It can be used in paper sizing and as an adjunct in binders for coatings.

Crane Co., Chicago valve and fitting manufacturer, has announced plans to acquire Swartwout Co., Cleveland maker of electronic control equipment. Crane has also entered into an agreement for the acquisition of National-U. S. Radiator Corp., Johnstown, Pa. producer of heating and air conditioning equipment, powered metals and fabricated products. . . Manchester Machine Co. has completed its new \$1,500,000 plant at Monroe, Ohio, and is transferring equipment from its former location at Middletown.

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checks deposition, and increases life of valves and piping—minimizes maintenance costs.

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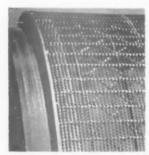
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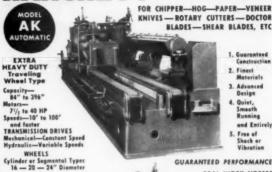
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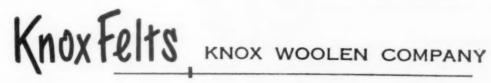
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The Last Word

PULP & PAPER

Editors' Page

"The Lost Half Century"

Students of literature and history and related subjects are becoming more and more concerned because the books and periodicals of this century are being printed on woodpulp papers which have only a very limited life-span. Most of this paper will disintegrate in 20 to 100 years

So now the students are calling the first half of this century the "Lost Half Century." While virtually all the books of this period fade and rot away, the parchment writings of the monks and other writers of the Middle Ages, even those of Egyptians, Greeks and Romans, the rag paper books of recent centuries still endure. Take for example, the recent discovery of the ancient Dead Sea Scrolls.

This is a very serious matter and the paper industry itself, as good citizens, and as an industry with a sense of history's values and the long term future outlooks (few industries have to plan for far ahead as this one, based upon wood growth!), will be just as much concerned as the librarians and literary circles.

Fortunately, the Council on Library Resources was incorporated in 1956 in Washington, D.C., to grapple with this problem of deteriorating papers. It was established with a grant of \$5,000,000 from the Ford Foundation to be spent over a 5-year period to find a solution to this and other research and library problems. It conducts work through grants or contracts. One study of paper preservation has produced useful results and a second study is well on its way. It means more lasting paper and binding for many books and periodicals of this second half of the 20th century. But the first half just about has to be crossed off as a loss.

Sure, there are microfilms, tape recordings, etc., of some things, but this is not a comfortable or even a practical way for scholars to browse into the first half of this century. Unless something is done about it, soon, poets and writers may never gain the lasting recognition of those who printed on the durable rag papers of the 19th century.

As we have said, everyone in this industry, because of the depth and long-term character of the industry itself, will understand and be appreciative of these efforts to preserve good literature and historical writings for future centuries. We are going to follow this work with interest, and may have some encouraging facts to report to our readers. We hope so.

Few people would be better qualified than papermakers themselves to make constructive suggestions for ways and means of preserving these writings. If you, as a papermaker, have any thoughts on the subject, it seems important enough to pass them on where they might be effective.

Clean Water and Air

It is important that the nation and its political leaders should know how much this industry has done to clean up the rivers and the air in the vicinity of its mills.

The day is coming when the growing population of America will require twice the water it is now using. This water will have to be used over and over again. Many industries and many communities must share responsibility.

This industry is spending \$2 million annually on research for clean air and water, about half by individual mills and half institutionally. Meanwhile water is being put to more uses by more people all the time. The capacity for treating

and disposing of industrial residues will have to more than double in the next 15 to 20 years.

Based on findings that the "best" slime growth results from continuous feeding. Crown Zellerbach Corp's. Sphaerotilus research at Camas, Wash., is now investigating control possibilites through feeding intermittently. Intermittent feeding in the lab eliminated slime growth, according to Dr. Herman R. Amberg, research specialist.

Crown Z slime studies indicate that the diffusing of discharges into streams may encourage wide slime growth. One of the promising methods for eliminating sugars from sulfite liquor is by fermentation, according to Dr. Amberg.

There are bound to be some important new discoveries in all the research being conducted today to clean up the air and the rivers. The pulp industry is doing far more than its share.

This is a field which beckons to young engineers and technicians. They could become pretty important persons in our country in the next decades.

A Grand Job in the South

This industry should take its collective hat off to the South for a marvelous job done in assuring the future of wood resources for pulp and paper.

The South's sweeping seedling program accounted for the planting of 373,000,000 new trees last year, according to a breakdown released by Henry J. Malsberger, general manager of the Southern Pulpwood Conservation Assn.

For most of the 11 states included in the survey (Virginia to Florida and west to Texas), the 1958-59 planting represented a record high. Leader once again was Florida with more than 87 million planted, over 10 million of which were given to private landowners.

which were given to private landowners.

Second state was Georgia, 83 million seedlings strong. It gave almost 17 million seedlings to private landowners. Alabama, with 43,670,000 seedlings, increased last year's production by 26% gave six million seedlings away.

production by 26%, gave six million seedlings away.

More than 55% of the trees planted—207,700,000—were produced by the 18 industry-operated nurseries in the region. Ten years ago, the entire industry in the South planted only 56 million trees. Private landowners, in those 10 years, have received 402,700,000 free seedlings from the industry.

The other states stacked up this way. North Carolina, 30,589,300; South Carolina, 28,789,375; Mississippi, 25,735,075; Texas, 24,806,000; Louisiana, 21,422,850; Virginia, 16,998,050; Arkansas, 5,524,500 and Tennessee, 5,211,110.

This is a tremendous achievement and anyone who works in this industry might very well place these figures in his hat inner band to show the critics of this industry who pay so much attention to the facts.

MFP Representative in Japan

Richard N. Crosby, representing Miller Freeman Publications, including PULP & PAPER and PULP & PAPER INTERNATIONAL, recently went to Japan for a month's visit to various industries in that country. He will visit leaders and discuss matters of interest to the pulp and paper manufacturing field and its allied industries. A prime interest for him will be the fisheries industries as he is business manager of Pacific Fisherman, a Miller Freeman Publication.

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